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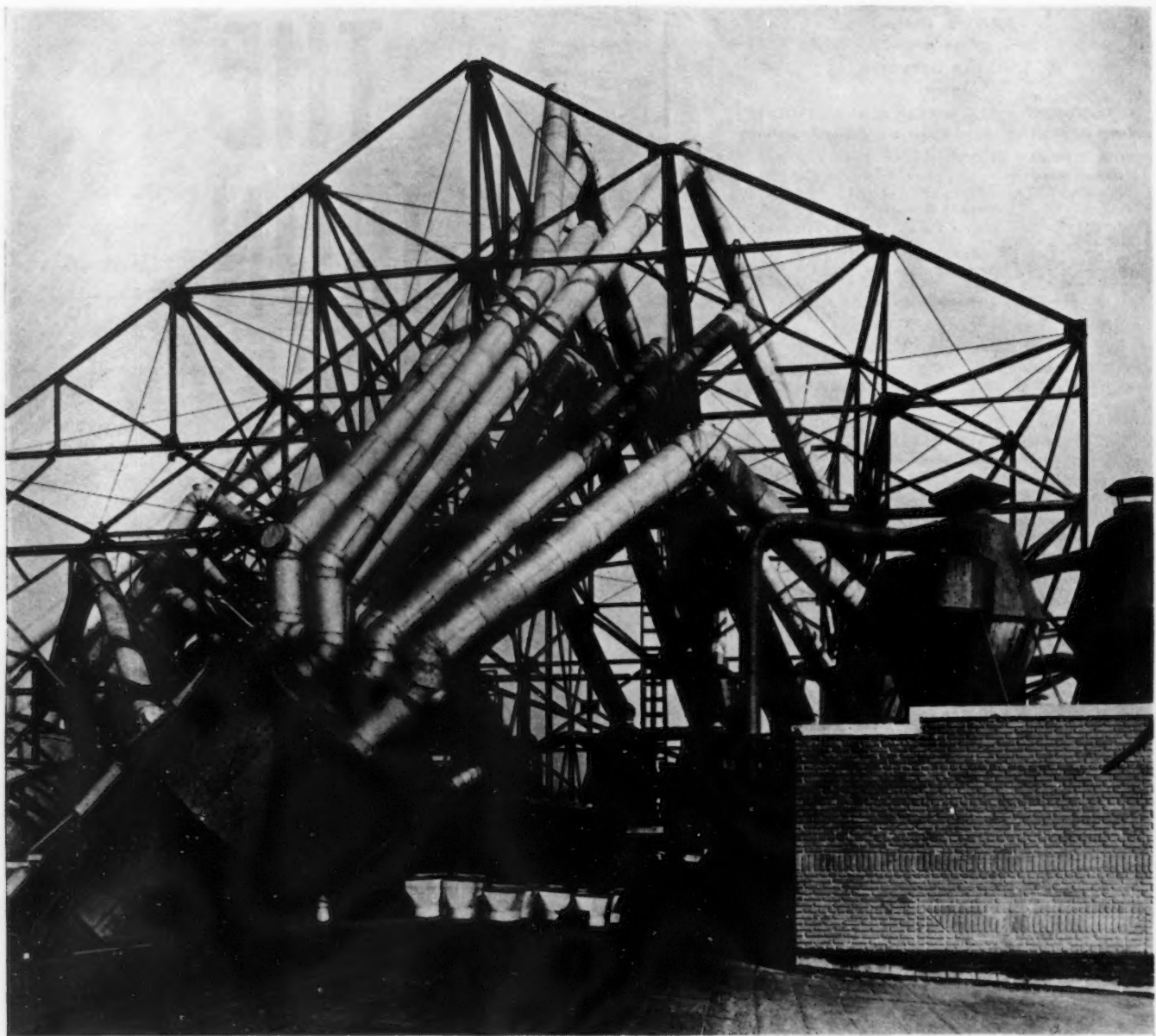
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THE IRON AGE *Contents*

OCTOBER 20, 1938

The Metal Industry Meets	13
4½ Plus 1 = Prosperity	14
Welding Is Heart of LeTourneau Production Set-up	18
Stress Relieving and Preheating	22
Copper-Chromium Alloys	25
Design Advances in Cutters and Small Tools	30
Convention Report of Steel Constructors	36
Gear Manufacturers Hold Meeting	38
On the Assembly Line	40
Washington News	44
THE NEWS IN BRIEF	54
Statistics on Metal-Working Activity	64
Weekly Ingot Operating Rate	65
Rate of Activity in Capital Goods	65
Plant Expansion and Equipment Buying	80
▼ ▼ ▼	
New Industrial Literature	89
Products Advertised	90
Just Between Us Two	91
Index to Advertisers	114

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for rust resistance

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▲ ▲ ▲ THE IRON AGE ▲ ▲ ▲

ESTABLISHED 1855

OCTOBER 20, 1938

Vol. 142, No. 16

The Metal Industry Meets

THIS week the National Metal Congress sponsored by the American Society for Metals assembles in Detroit to look at the past and the future.

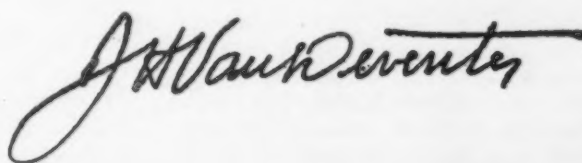
The economics of metals recognizes no geographical boundary lines. It embraces the world in its scope and so far as we know from present knowledge extends far beyond it. For, if human life should exist on other planets of our solar system or upon the planets of the thousands of solar systems which we do not call our own, you would find that life there is undoubtedly affected and its material progress measured by the degree of utilization of those metals which we already know constitute such a pre-dominate physical portion of all of the universe.

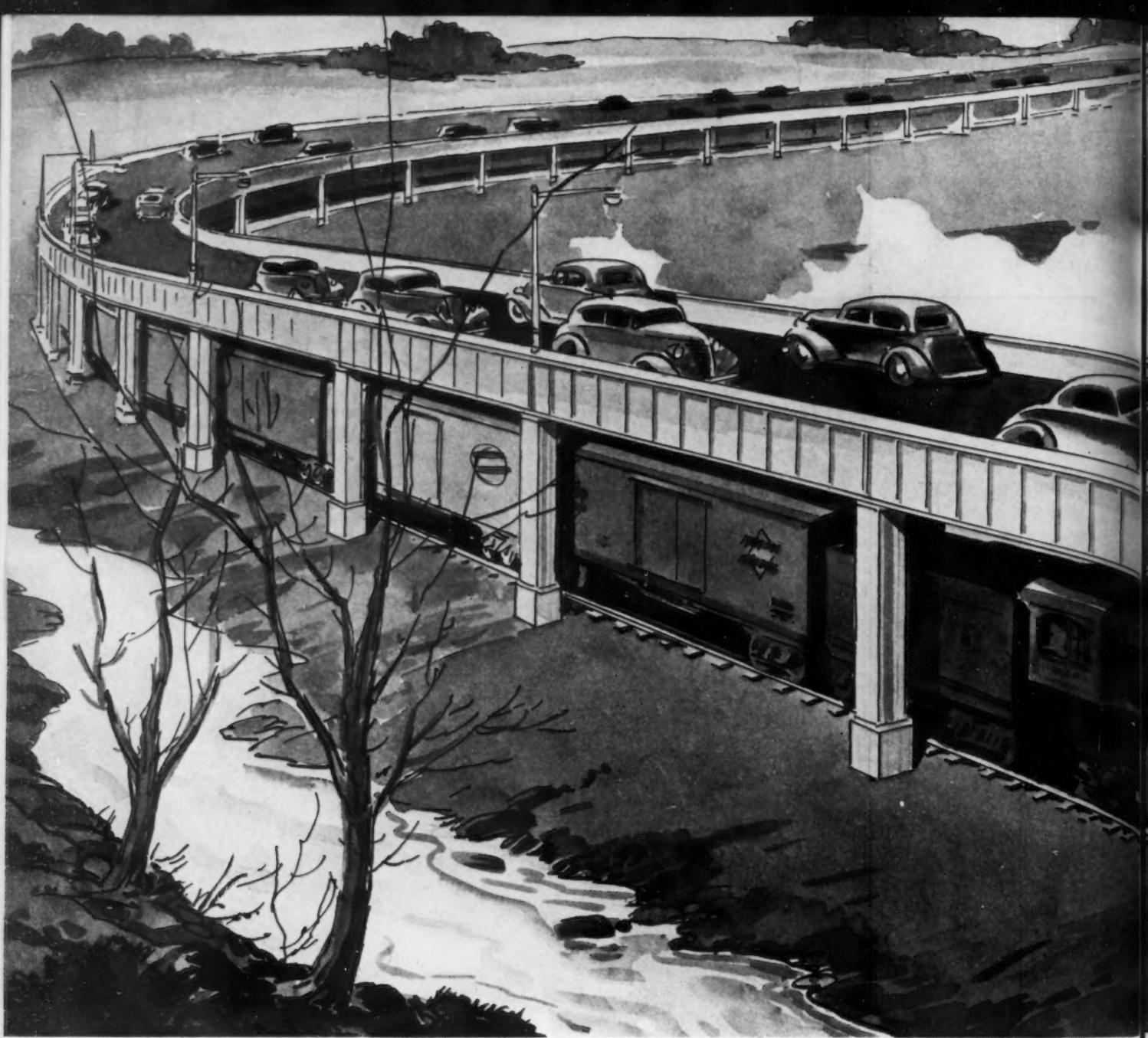
In our own little world, the fabric of life itself is woven into a web of metal. It is as much a part of us as the air we breathe, and like the air such a familiar and accustomed part that we do not realize or appreciate its importance. We take it for granted. Even metallurgically minded men, who are responsible for the forward strides that the world is taking and will take in adapting metals to the needs of society, do not in their intense and busy application to the task at hand sufficiently realize the vital part that they are playing in shaping, for good or for bad, the lives and the livings of their children's children.

Is that future to be world wars? Ask yourself what war would be without metals. Or if, pray God, our swords shall be beaten into plowshares, ask yourself what single division or branch of peaceful human progress could divorce itself from the use of metals without losing, at that instant, all of the fruits of centuries of progress and without vanishing into a state of barbarism.

What would become of the surgical profession if we took away from the skilled hands of its practitioners the tools with which they work their miracles of mercy? What would become of transportation, or the chemical industries, or the food industries? What would become of agriculture without these materials that are as vitally necessary to feed our populations as is seed itself?

Society for metals. Metals for Society. Cause and effect. It will be strange indeed if our future progress and knowledge do not respond in greatly accelerated tempo because of it.





4½ PLUS 1 =

BEFORE reading this article let's remember very vividly that for every ton of finished steel produced, approximately 4½ tons of raw materials are used. As the railroads haul practically all the raw materials to the steel mills and the finished products away, railroads get approximately 5½ tons of revenue freight for every ton of steel produced.

In some instances on iron ore, the railroads get two hauls—one to the docks at Superior, Duluth, Two Harbors and other lake-loading points, and then after lake transportation to lower

lake ports, traffic again to Youngstown, Pittsburgh, Weirton, Johnstown and other steel-producing centers.

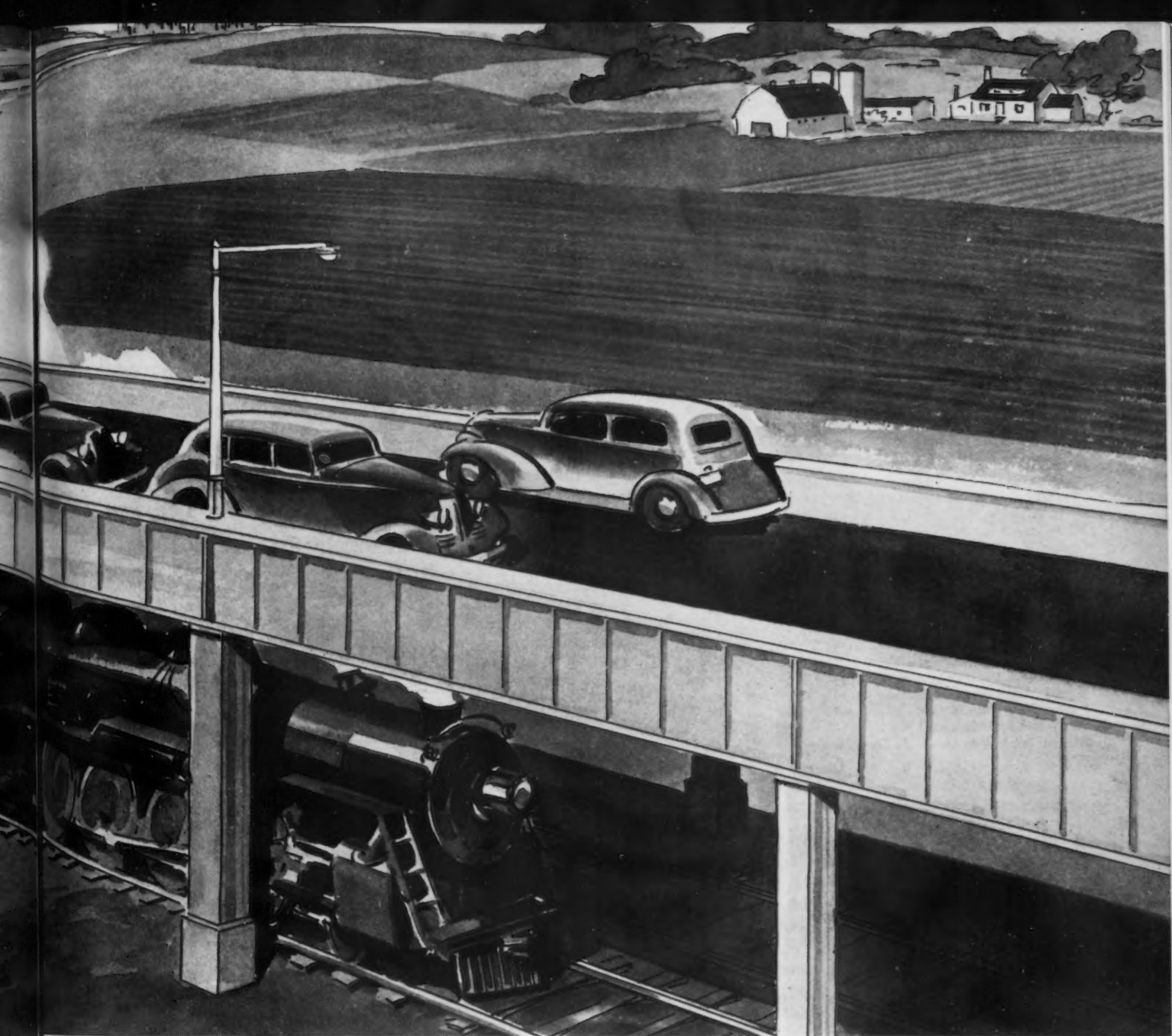
Raw materials entering into steel production come from all parts of the country—the principal materials being iron ore, coal, scrap, brick, limestone, fire clay, manganese, sand, molybdenum, tungsten, and numerous other products.

From the brief description above you can see how closely the railroads and the steel mills are tied in, as far as production and traffic are con-

cerned. In other words, railroads are earning when steel production is at a fair level.

Let's go back a few years and see what happened. From 1922 to 1926 steel ingot production averaged 41,388,000 tons yearly. During this period, building construction took 17.2 per cent of finished steel produced and the railroads 25.1 per cent, or a total of 42.3 per cent of finished steel for a five year average between two consumers.

Then what happened! Here's the figures:



PROSPERITY

By W. E. CROCOMBE
President, American Manganese Steel Co.

o o o

Year	Ingots Produced (Tons)	Building Con- sumption Per Cent	Railroad Con- sumption Per Cent
1927	43,777,000	22.0	19.0
1928	50,325,000	16.5	16.0
1929	54,850,000	16.5	17.0
1930	39,595,000	19.0	15.0
1931	25,429,000	18.5	13.5
1932	13,464,000	8.5	12.0
1933	22,894,000	11.5	9.0
1934	25,949,000	13.3	10.6
1935	33,940,000	11.7	6.5
1936	47,512,000	12.5	10.3
1937	50,250,000	7.9	12.0

In the five-year period from 1932 to 1937, building consumption and railroads fell off from a 42.3 per cent

average consumption to around 20 per cent—quite a drop.

It might be interesting at this point to give the fabricated structural production in tons for the same period:

	Tons
1922 to 1926 average	2,660,000
1927	3,048,000
1928	3,287,900
1929	3,597,825
1930	2,707,600
1931	1,830,800
1932	955,000
1933	922,800
1934	1,044,593
1935	1,068,603
1936	1,609,016

Now nobody was disappointed with business conditions from 1922 to 1930. In fact, everyone was very well pleased—but how did it happen?

Here's how it happened! Nobody can give you the exact figures of the amount in dollars of real estate bonds floated in this country from 1922 to 1928. We are now used to talking in billions, so here are a few figures on real estate bonds floated during the above period and by whom issued. This might have some bearing to the amount of structural business placed from 1922 to 1931. Remember these

figures are only to 1928 and you can approximate the additional amount loaned on building construction by banks, building and loan associations and insurance funds, also private capital.

REAL ESTATE BONDS—Issued from 1922 to 1928

S. W. Straus & Co.	\$589,866,000
Real Estate Mortgage Bonds, sold by misc. banks, brokers, mortgage and investment houses, as listed on pages 977 to 1064 of "Moody's Investors Service—1928"	787,990,000
Ditto . . . pages 1988 to 1994..	49,875,000
American Bond & Mortgage Co.	114,415,000
Greenebaum Sons Investment Co.	90,480,000
G. L. Miller & Co.	60,990,000
H. O. Stone	40,885,000
George M. Forman Co.	24,980,000
Lackner Butz & Co.	21,674,000
F. H. Smith Co.	21,395,000
Leight & Co.	18,835,000
Commonwealth Bond Co.	18,685,000
Adair Realty & Trust Co.	16,950,000
Empire Bond and Mortgage Co.	14,930,000
Federal Bond & Mortgage Co..	12,625,000
S. Ulmer & Sons Co.	13,645,000
Hunter Dulin & Co.	11,450,000
Puritan Mortgage Co.	13,045,000
U. S. Bond & Mortgage Co..	8,841,000
Backus Fordon & Co.	4,710,000
	\$1,934,516,000

These are all the authentic figures I could find, but ONE BILLION, NINE HUNDRED AND THIRTY-FOUR MILLION DOLLARS of real estate bonds, and other billions sold by banks and investment houses, certainly primed the pump for a number of years. Quite a number (probably the majority) of these bonds are sound investments, but the great majority of them were sold to the working class of this country.

On January 29, 1938, in one of the Chicago papers the following figures appeared:

REAL ESTATE ISSUES ON WHICH REORGANIZATION WAS UNDERTAKEN

	No. of Issues	Par Value in Default
American Bond & Mortgage.....	172	\$103,651,390
Greenebaum Investment Co. (issues).....	235	144,750,000
S. W. Straus & Co. (issues)	239	205,101,900
(Totals)	646	\$453,503,290

Figures on only three issuing houses!

I can always find out how much the Federal debt increases every day, but I can never remember reading the actual amount of real estate bonds floated or the actual amount in default.

Nevertheless, the tonnage of steel

and other supplies that went into all these hotels, banks, apartments, hospitals and factories created an era of prosperity in this country for eight or nine years. Where the money came from nobody seemed to care. One thing is certain, however, the old 6 or 7 per cent gold mortgage real estate bond will never be sold to the public again in our day.

Checking back over the figures of steel ingot production, you will notice quite a pick up in 1935, 1936 and 1937, in spite of the fact that percentage of building and railroad consumption for these three years ran 18.2 per cent, 22.5 per cent and 19.9 per cent. Quite a drop from the five-year average of 42.3 per cent in 1922 to 1926.

What Caused the Increase

Last January in writing an article for the U. S. News I had occasion to write to Mr. Ickes and asked him for the tonnage specified for PWA projects from 1933 to 1936. The following is an excerpt from the answer by his assistant, Mr. Michael W. Straus:

"On the basis of careful records kept of every PWA project, the Bureau of Labor Statistics reported that a total of 9,500,000 tons of all types of steel, including structural steel and steel going into machinery and transportation equipment, had been used on the PWA program in the four years between June, 1933, and July, 1937.

"The Bureau stated that the value of orders for this amount of steel approximates \$888,000,000."

After all 1935, 1936 and 1937 were good years. Why? Because steel production averaged 44,000,000 tons of

795,000 tons during that period. Then the great World War primed the pump—God forbid it ever happen again—but to prove that steel production is the basis for prosperity in this country, here's what happened to steel ingot production:

	Tons
1916	41,402,000
1917	43,519,000
1918	43,051,000
1919	33,695,000
1920	40,881,000

With an average production of approximately 40,000,000 tons of ingots per year, what happens to other industries? First, the railroads pick up about 200 million tons of revenue freight. How about labor? Generally speaking this 200 million tons of raw material must be handled three times.

First—Ore mined, coal mined, scrap loaded into cars or boats and shipped to mills.

Second—All unloaded at storage bins at steel plants.

Third—Reloaded for use at blast furnaces, open hearths or Bessemer.

Quite a little labor involved in handling 200 million tons of raw materials three different places.

So far all this has been very nice, but how are we going to continue along on 40,000,000 tons of ingots, or better, per year. It's all very nice to have large structural and beam mills capable of producing 100,000 tons per month, large plate mills with capacity of 75,000 to 90,000 tons per month, rail mills at 75,000 tons per month. The most important angle on keeping these mills busy is to get new customers and new outlets for their rolling capacity. During the last 25 years the automobile and tractor industries have definitely taken their places as standard consumers of steel products. The container industry is a steady source. The only major new industry recently developed for steel consumption is air conditioning and mechanical refrigeration. These units, however, use principally sheets and the tonnage is light. Real steel production is in large beams, channels, plates and rails.

Is There a New Field for Steel Production

Let's check over a few installations finished in the last three years and see what material was used in their construction. It really is impossible to

put these figures on paper and realize what they meant to the steel industry of this country.

structed over the Chicago and North Western right-of-way to Evanston, Winnetka, Highland Park, Lake For-

west, leading from the Union Depot.

The above are just a few thoughts and possibly there are a great number of places where highways over tracks leading into cities would reduce traffic congestion and certainly reduce the number of accidents and deaths.

Would this help railroad revenue?

Possibly some plan could be worked out whereby railroads would receive either a flat rental for air rights or a division of the toll receipts.

In closing, the possibilities are here for real self-liquidating projects. You will hear complaints about tolls, but if an automobile driver can save 30 minutes' time and eliminate 30 or 40 stop-and-go signs, he is really saving time and also money as far as gasoline consumption is concerned.

Certainly the country today is in need of four major and immediate requirements:

- 1st—more steel production.
- 2nd—more railroad revenue.
- 3rd—more employment.
- 4th—less traffic accidents.

The elevated highway program will take care of all four of these requirements. If they are ever built, let's hope they are built by private contractors. Keep the local politicians out of any such program.

I would like to see a committee appointed by the Iron and Steel Institute, the railroads involved, and the RFC, who probably would have to do the financing, to study the possibilities of a program of this kind.

First: San Francisco-Oakland Bay Bridge	Structural steel and plates.....	152,000 tons
	Cable wire	18,500 tons
	Reinforcing bars	30,000 tons
	Concrete	1,000,000 cu. yards
	Cement	1,300,000 barrels
	Timber	30,000,000 board feet
	Paint	200,000 gallons
Second: The Triborough Bridge in New York	Structural steel and plates	83,500 tons
	Reinforcing bars	15,000 tons
	Concrete	400,000 cu. yards
Third: Golden Gate Bridge	Structural steel and plates	45,000 tons
	Cable wire	22,000 tons
	Reinforcing bars (est.)	10,000 tons

These three projects consumed around 400,000 tons of finished steel products. The cost of these three bridges as estimated is as follows:

San Francisco-Oakland Bay Bridge	\$78,000,000
Triborough Bridge—N. Y. City..	60,300,000
Golden Gate Bridge—San Francisco	35,000,000
Total	\$173,300,000

The money spent for construction was obtained from RFC buying bonds on the Oakland-San Francisco bridge; PWA funds in addition to New York City funds on the Triborough Bridge; and according to reports Golden Gate Bridge and Highway District Authority sold the bonds on the Golden Gate Bridge privately. These projects are all toll bridges or highways and do not increase present high level taxes to maintain. We must develop more of these building projects that are really self-liquidating to maintain an average of 40,000,000 tons of ingots per year.

What are the possibilities for further real self-liquidating projects? In this country we still continue to kill about 40,000 persons per year in automobile accidents. In Chicago alone we kill about 1000 each year. The density of traffic in our large cities is such that *elevated highways must be built sooner or later. WHY NOT NOW?* One of the chief reasons is that no money is available. What with relief costs mounting and gasoline taxes being diverted into other channels, elevated highway construction is at a standstill, until some means or methods are adopted to finance them by toll repayments—with no increase in present tax rates.

Have the railroads hidden assets in air rights over their right-of-way leading into large cities?

Could an elevated highway be con-

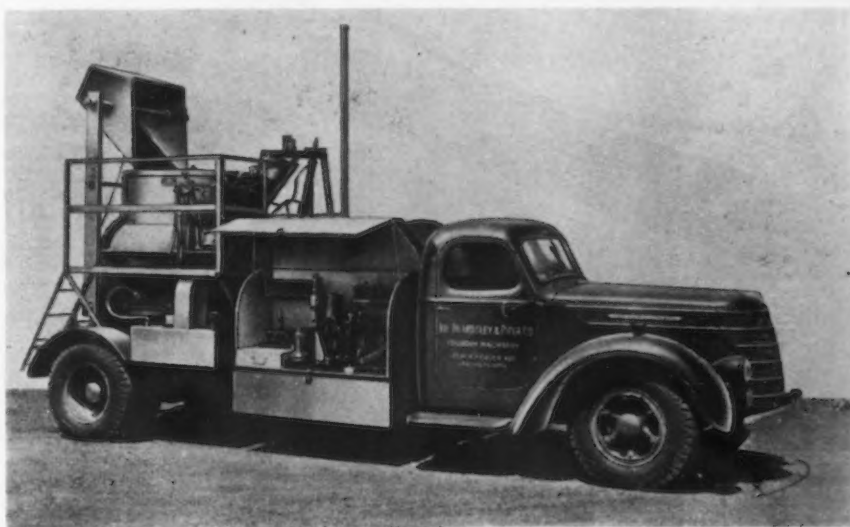
est, and the north shore suburbs? How about an elevated highway starting at Jackson Boulevard over the C. B. & Q. right-of-way? This would connect with the airport at Cicero Avenue, also the west side suburbs of Berwyn, Riverside, LaGrange, and Hinsdale, out to Aurora.

Imagine another elevated highway over the New York Central tracks to Englewood, where it would fork out—one branch to South Chicago, Indiana Harbor, Whiting and Gary over the New York Central tracks, and the other fork over the Rock Island to the southwest.

How about routing all automobile traffic through Cleveland on an elevated highway over New York Central tracks through the old Cleveland depot?

At St. Louis an elevated highway

SCHEDULED to make its first tour among Mid-Western foundries is this Beardsley & Piper Co. demonstration truck on which is mounted a Speedmullor, the firm's new sand preparation machine that uses rubber mulling balls. The unit will be charged with spent foundry sand by means of a skip hoist at the rear and reconditioned sand will be discharged from the side into receptacles for carrying to the molding floor. The touring unit is also equipped with many types of A.F.A. standard testing equipment to make heat, moisture, strength and permeability tests of sand.



Welding Is the Heart of Le Tourneau

IT is a revelation to walk through the plant of R. G. Le Tourneau, Inc., Peoria, Ill., world's largest manufacturer of tractor-drawn earth moving equipment. Standing at either end of the 1200-ft. main aisle of the plant, one sees the bluish-white lights of countless electric arcs flashing in every direction.

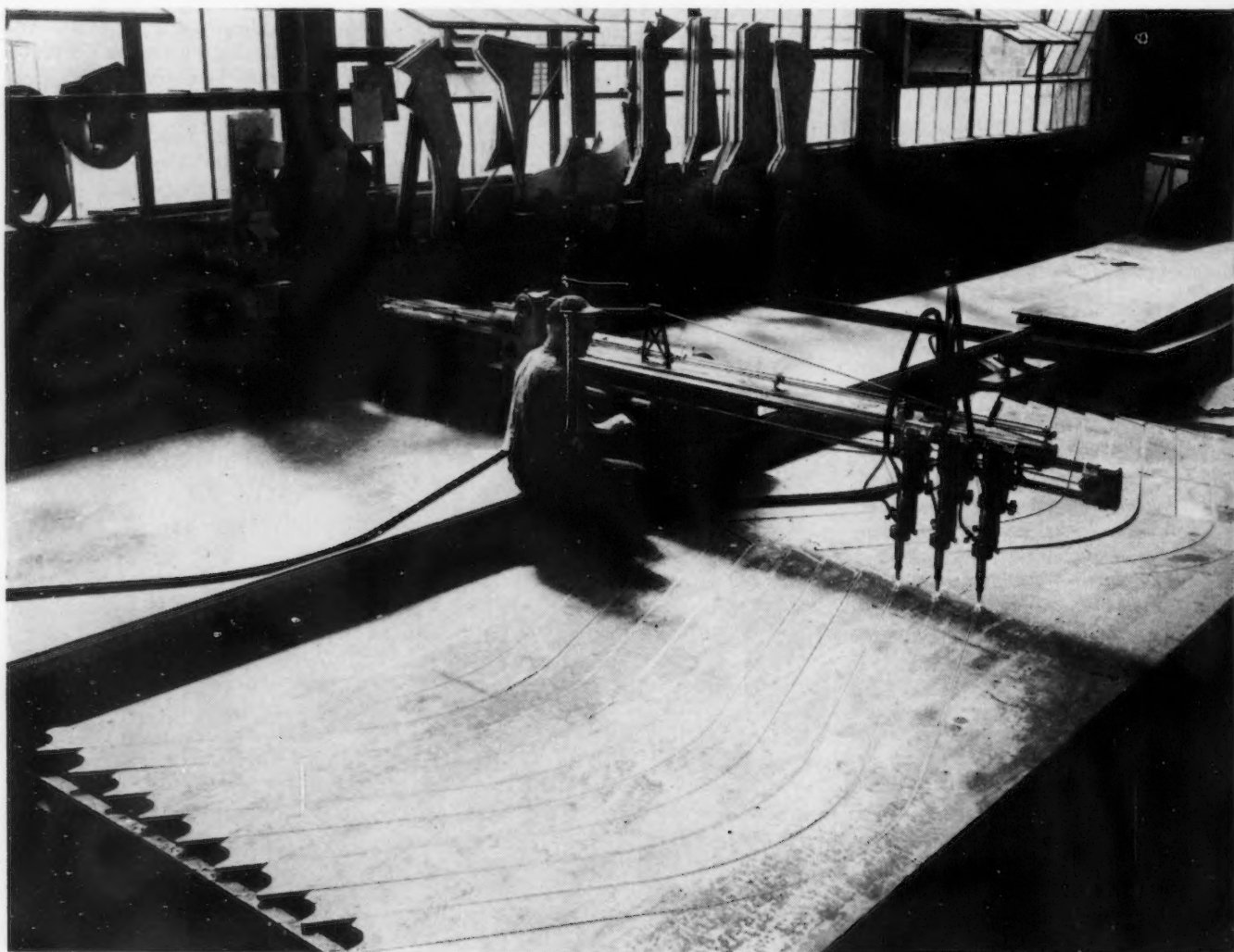
Electric arc welding is the exclusive method of manufacture at Le Tourneau, and production welding has been developed to a high degree of efficiency. Use is made of every facility for employing the electric arc to greatest advantage. There is flame-cutting equipment (Fig. 1) for cutting

plate to the many different shapes and sizes required in utilizing arc welded fabrication. There are efficient jigs and fixtures (Fig. 2) for holding the component parts of the various structural units of the products in proper position for welding. There is equipment for cleaning welds (Fig. 3) and heat treating parts which have been welded (Fig. 4). There are conveyors to aid weld production by transporting

parts being fabricated past arc welding operators (Fig. 5). There are large overhead traveling cranes to transport heavy parts, and small jib cranes for moving work into various positions. There are also lathes, boring mills, presses, saws, and other necessary processing machinery.

Largest user of arc welding under one roof, Le Tourneau not only manufactures all of its products by the electric arc process but fabricates a great deal of its own production equipment. All jigs and fixtures are arc welded. So also are the heat-treating furnaces, the conveyors, the 12-ton and 15-ton overhead cranes, the 50 odd 2-ton jib

FIG. 1—Steel plate cut by this Camograph flame-cutting machine flows in a steady stream to the welders.



Production Set-up

By A. F. DAVIS

*Vice-President, Lincoln Electric Co.,
Cleveland.*

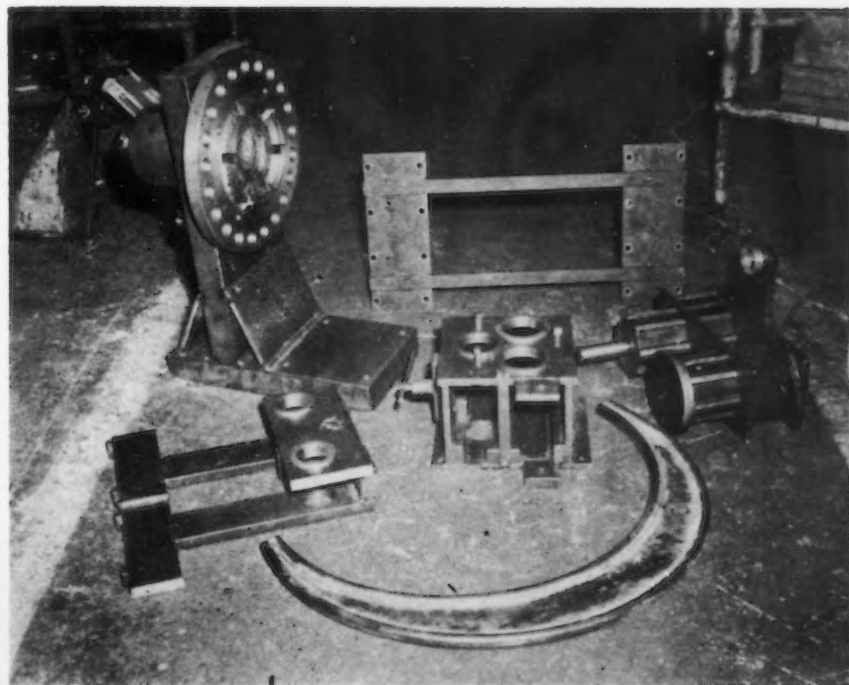


FIG. 2—Weld-fabricated jigs and fixtures are used to hold component parts in proper position for welding.

cranes, many special lathes, drill presses, boring mills, etc.

Engineering Department Small

For the type and amount of finished product turned out by Le Tourneau, one would expect a large engineering department. Yet it consists of only 10 men. The ability of this small staff to handle all engineering and drafting is attributed to the simplicity of designing for arc welded construction. According to Ray Petersen, vice-president and plant manager, this virtually amounts to merely calculating sizes of structural members to be used, indicating where the parts are to be cut and the amount of welding to be employed in joining them together. There is no complicated designing and detailing. Mr. Petersen estimates that the engineering department would be two, possibly three, times as large as it is if conventional methods of manufacturing were used to produce the volume of finished products turned out annually by the company.

Welded machine parts flow through the Le Tourneau plant like castings through the average plant. On all sides are bins filled with fabricated parts, ready for the machine shop or the assembly line.

It is extremely interesting to see how this factory transforms steel plate and shapes into completely finished products. In 1937, the company's production of arc welded steel products was valued at more than \$5,600,000. This production required 22,720 tons of steel.

Production Set-up

The entire production set-up centers around arc welding. Steel cut to a wide variety of shapes and sizes, flows in a steady stream to the welders. Welders in one department receive parts for gears; in another, cable sheaves; another, wheels; another, frames, etc. Selecting the various pieces of steel for the machine part the operators place the pieces into a jig, "strike" the arc and weld up the part. If it is to be a moving part,

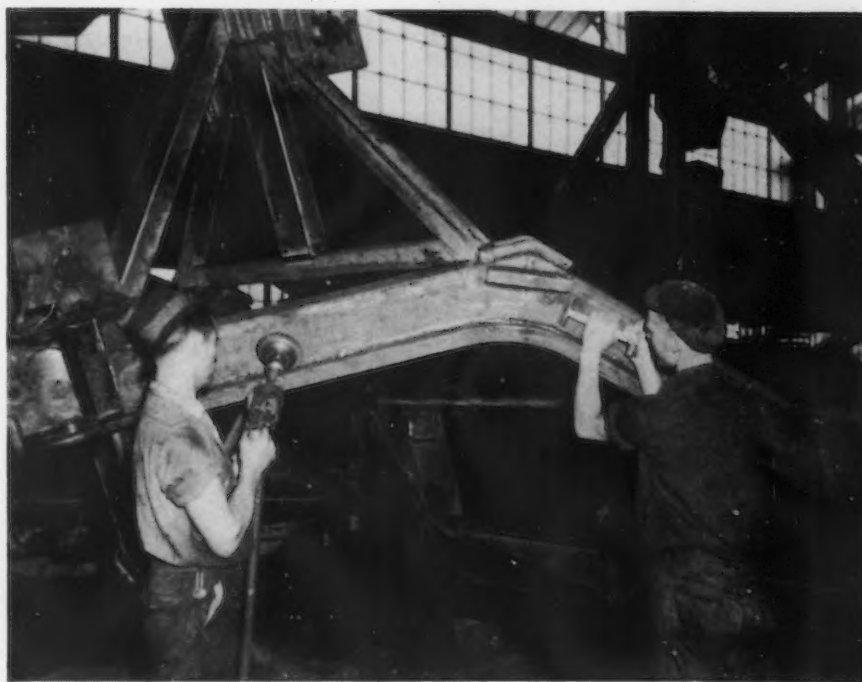
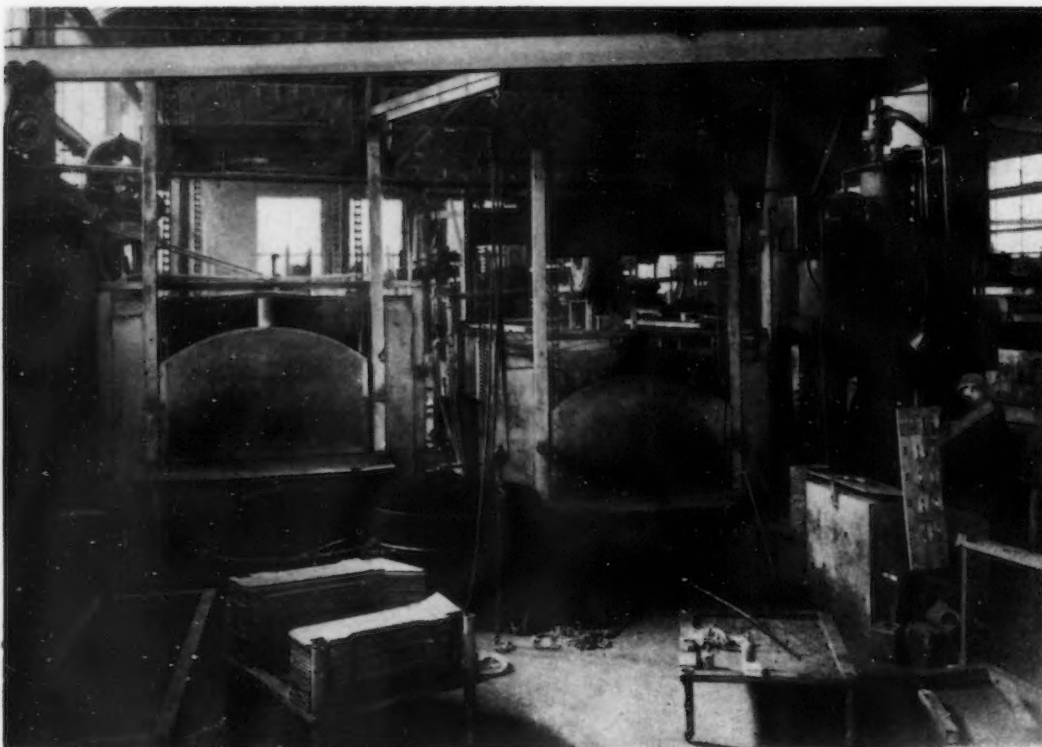


FIG. 3—Welds are carefully cleaned. Removal of slag, by chisel or by file, is followed by wire brush polishing that prepares the weld surface for painting.

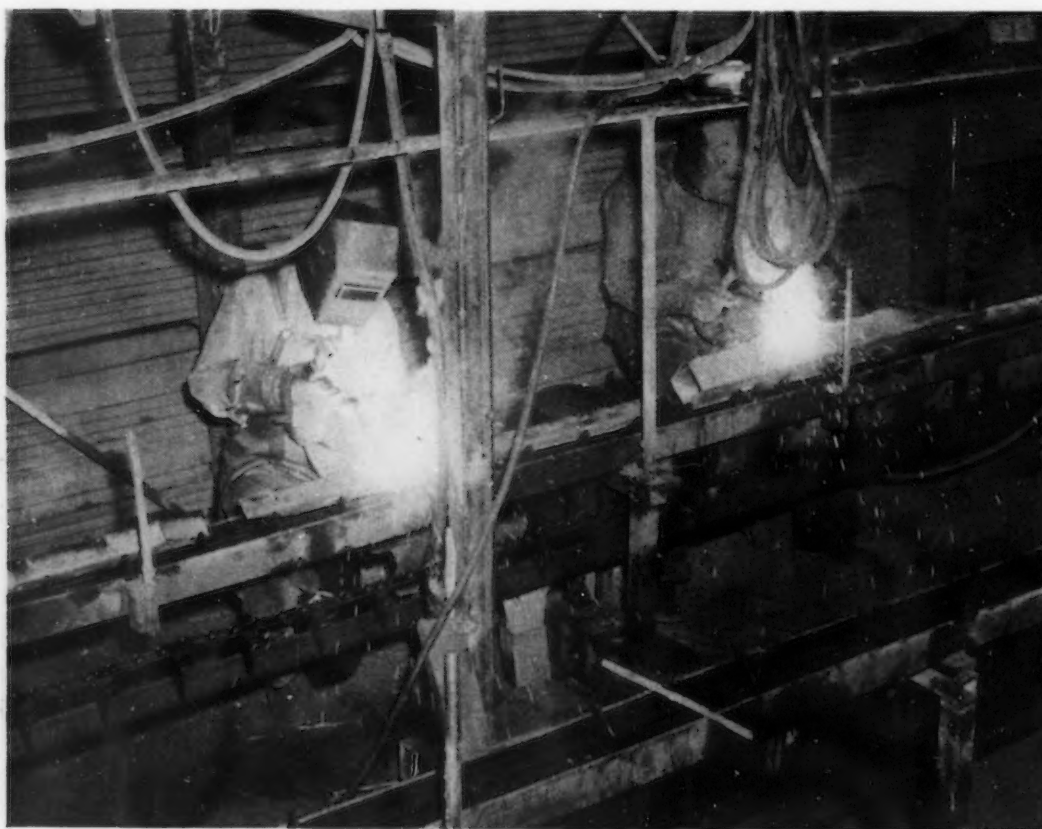


o o o
FIG. 4 — Welded parts are heat treated in these furnaces, which are themselves of welded construction.
 o o o

very likely machining will be necessary. In this case the partially fabricated part goes to the machine shop, to return later for addition of the remaining components of the assembly.

The machining of fabricated parts in various stages of fabrication is part of the regular production. In some instances, it is done simply because the particular stage offers best opportunity

for machining, the surfaces to be machined being easier to reach. This is true of gears and wheels. The latter make several trips to the machine shop before fabrication is complete. This



o o o
FIG. 5—Slow-speed conveyors carry parts in process past the welders.
 o o o

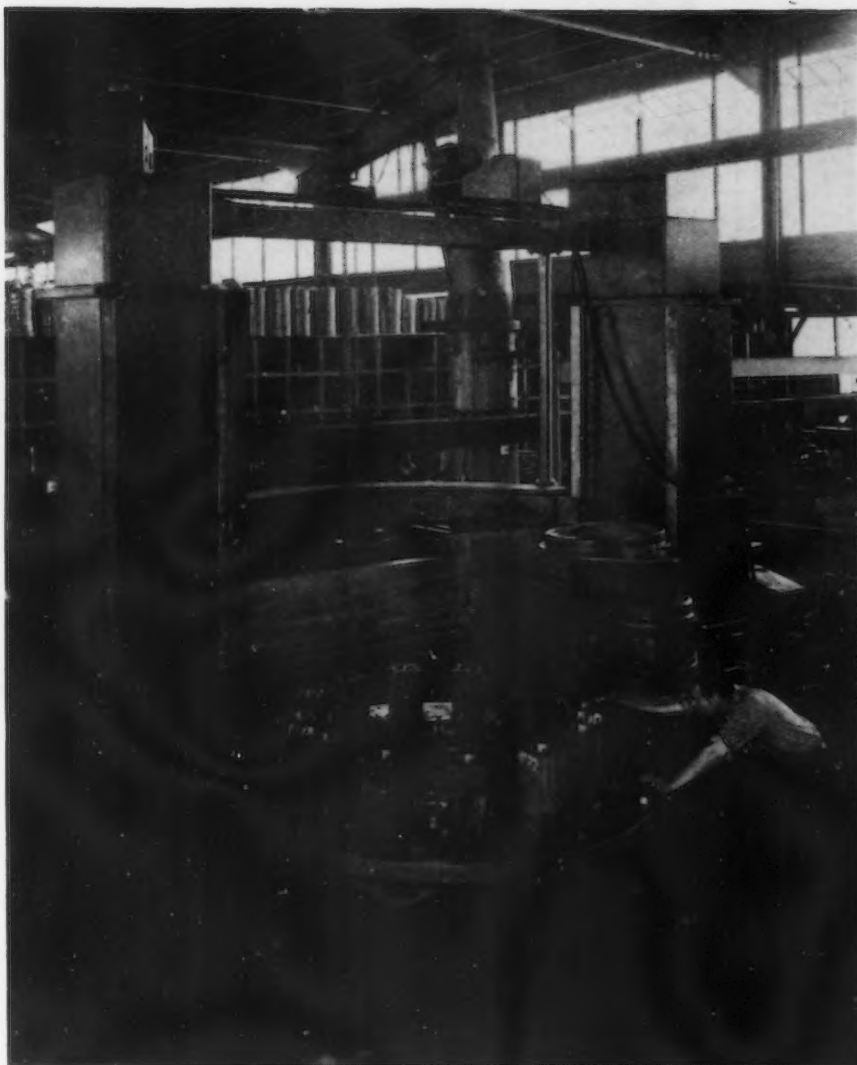
procedure is done out of consideration of economy in the overall manufacturing operation. It is a question, for example, of doing the entire machining operation on gears after fabrication or performing it in steps as fabrication progresses. Le Tourneau believes the latter the more economical. Of course, production is geared so that the movement of parts for machining or welding is in quantities. All departments are skillfully coordinated.

A definite part of the production is cleaning of welds (Fig. 3). This is done very carefully and thoroughly in a department arranged and equipped for the work. Slag is chipped off by chisels or files. Then a workman with a power driven, rotary wire brush, polishes the welds so that a pure steel surface is left for painting.

Production at Le Tourneau with arc welding is not confined to parts fabrication. Another important use of arc welding is in hard facing parts of equipment which receive the brunt of abrasive action in service (Fig. 7). In this Lincoln "Abrasoweld" electrodes are employed. The process is credited with increasing the service life of scraper blades, rooster shoes and cable guides five times.

Noteworthy for its exclusive use of arc welding in manufacture, Le Tourneau houses its offices in arc-welded steel, air-conditioned buildings.

Arc welding and arc-welded products and structures are everywhere. Everyone in the plant thinks in terms of this process of joining metals. Instead of regarding the electric arc as something strange and mysterious, the company's employees look upon this modern production tool as a Le Tourneau tradition. It is the process which has made Le Tourneau.



ABOVE

FIG. 6—Special machines built by arc welding include this Tournamil, here shown in continuous operation in milling power unit control cast necks. The machine is also used as a boring mill. Special jib cranes such as shown at the rear of this machine are extensively used throughout the Le Tourneau plant for parts handling.

o o o

BELOW

FIG. 7—Scraper blades are hard faced during manufacture to increase service life.



Stress Relieving and Preheating

By W. G. THEISINGER

Welding and Metallurgical Engineer,
Lukens Steel Co.

*LAST week the author pointed out some of the problems of present day welding. A description was given of the welded specimens prepared to study the effect of stress relieving, and the resulting experimental data were listed. Attention also was given to the effect of stress relieving on hardness and microstructure, and, in the following concluding section of the article, this discussion is completed. Herein, the question of residual stresses in the welding of heavy plate sections is also covered in some detail.**

IT is interesting to note that as-welded SAE 1035 steel over the entire range of welding conditions did not develop a structure of an order higher than sorbite. By comparing these structures with the companion

samples in Fig. 7, which were stress relieved at 1150 deg. F., structures identical with the as-welded samples are found. Again the range from large-grained pearlite to fine-grained sorbite appears for the same welding

speeds. It is not to be expected that this low temperature treatment would have any effect on the pearlite and sorbite found in the welded samples.

While the stress relief has reduced the residual stresses in a welded plate as shown in the stress experiments in Figs. 2 and 3, it has only slightly reduced the hardness and has had no effect on the microstructure. However, in the case of air hardening steels, not only will the stress relieving treatment reduce the residual stresses, it will also materially reduce the hardness, and change the microstructure.

An example of these changes is shown in the experiment on an SAE 4150 steel treated in the same manner

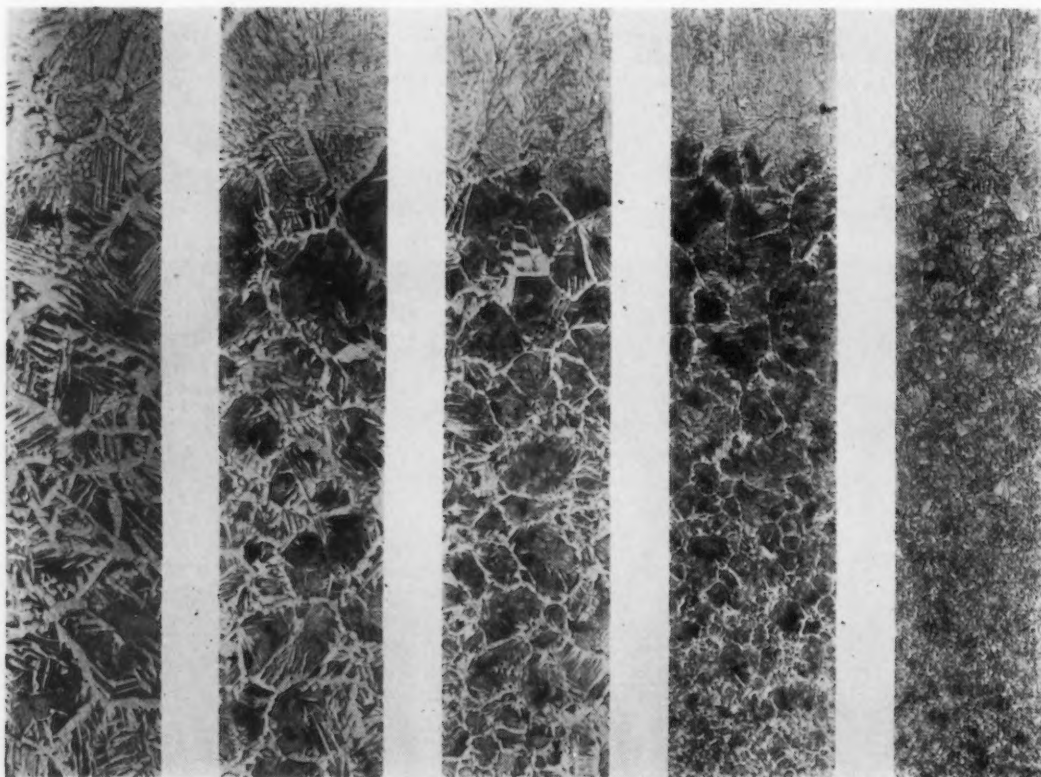


FIG. 7—SAE 1035 steel after stress relieving. At 150 diameters. Structure unchanged, being still pearlite and sorbite.

as described for the previous set of specimens. This steel, containing, in addition to the common elements, molybdenum of 0.51 per cent and carbon of 0.52 per cent, is readily susceptible to heat treating operations. The hardness curve of the as-welded specimens is shown in Fig. 8, where the range in hardness of the hard zone covers 340 points, or from 302 Vickers-Brinell to 642, and the spread between plate and the maximum speed is from 287 to 642 for 355 points.

After stress relieving, as seen in Fig. 9, the range drops 100 points, or to 277 Vickers-Brinell at the 4-in. speed to 377 at the 18-in. speed, and the spread between the plate and the 18-in. speed is 110 points or 267 to 377. The maximum hardness of 642 Brinell developed in this steel has been reduced to 377 by stress relieving, but the low hardness values were only slightly affected.

The microstructure is actually changed in this steel by stress relieving, as illustrated in comparing the as-welded specimen in Fig. 10 with the stress relieved specimen in Fig. 11. In the slow welding speeds of Fig. 10 the structure in the plate metal adjacent to the weld is made up of both sorbite and troostite. The medium speed of 8 in. per min. is both troostitic and martensitic, and the higher speeds show a solid area of martensite. The 18-in. specimen is definitely made up of fine-grained martensite, as is to be expected from the hardness of this specimen which is 642 Vickers-Brinell.

The as-welded specimen at the 4-in. speed containing sorbite and troostite has been changed by stress relieving to sorbite alone, and the martensitic structure of the higher speeds has been reduced to fine-grained sorbite. In this steel, the stress relief has actually changed the microstructure together with the hardness. The residual stresses should also be reduced in accordance with the previously described determinations.

It has been demonstrated that the commercial stress relieving treatment will be efficient for the purpose for which it is intended, namely, to relieve the residual stresses set up by welding. It will also reduce the hardness of the metal adjacent to a weld to a degree depending upon the hardness of the as-welded steel base plate. It will change the microstructure to a lower order when the structure present is unstable at that temperature and thereby put the steel in a commercially usable state. However, it is not to be expected that stress relieving will

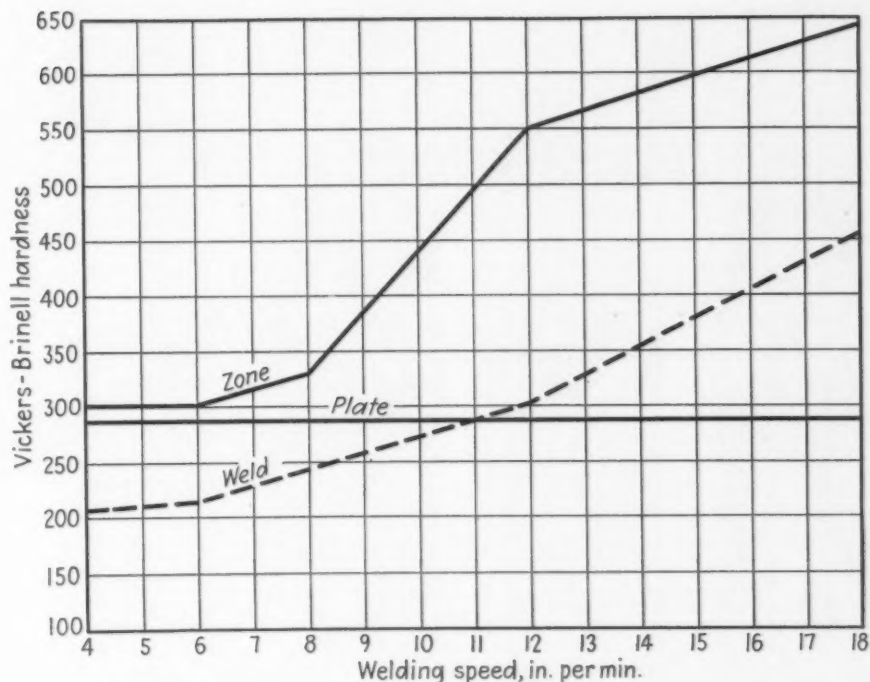


FIG. 8—SAE 4150 steel (Cr-Mo alloy steel with 0.52 carbon) welded at constant current (375 amp.) and constant potential (23 volts). Maximum hardness 642 Brinell in as-welded condition.

overcome the danger of cracking after the cracks are once formed during the welding process.

Welding Heavy Plate Sections

The question of residual stresses is of added importance in the welding of thick plate, for in addition to the stresses normally set up due to the welding process in the cooling and contraction of the weld metal, heavy plate introduces an added rigidity in the joint being welded by virtue of the increased depth of the groove to be filled. It has been the custom, in order to maintain the tensile strength in lb. per sq. in. of the steel being

used, to increase the carbon content of the material. As the carbon content of the plate metal is increased, the hardening of the metal adjacent to the weld becomes greater. Likewise as the plate thickness increases, the quenching effect, because of the greater mass, increases. All these conditions may be expected in the welding of heavy plate, but these difficulties may be reduced considerably by keeping the vessel warm during forming and welding. This is especially true when the structure or particular part is held rigidly at or near the joint.

When small beads are deposited in

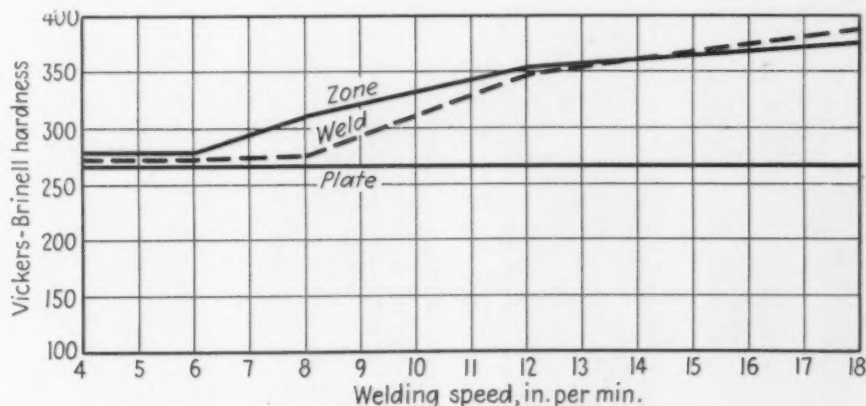


FIG. 9—SAE 4150 steel after stress relieving. Maximum hardness of hard zone is 377 Brinell.

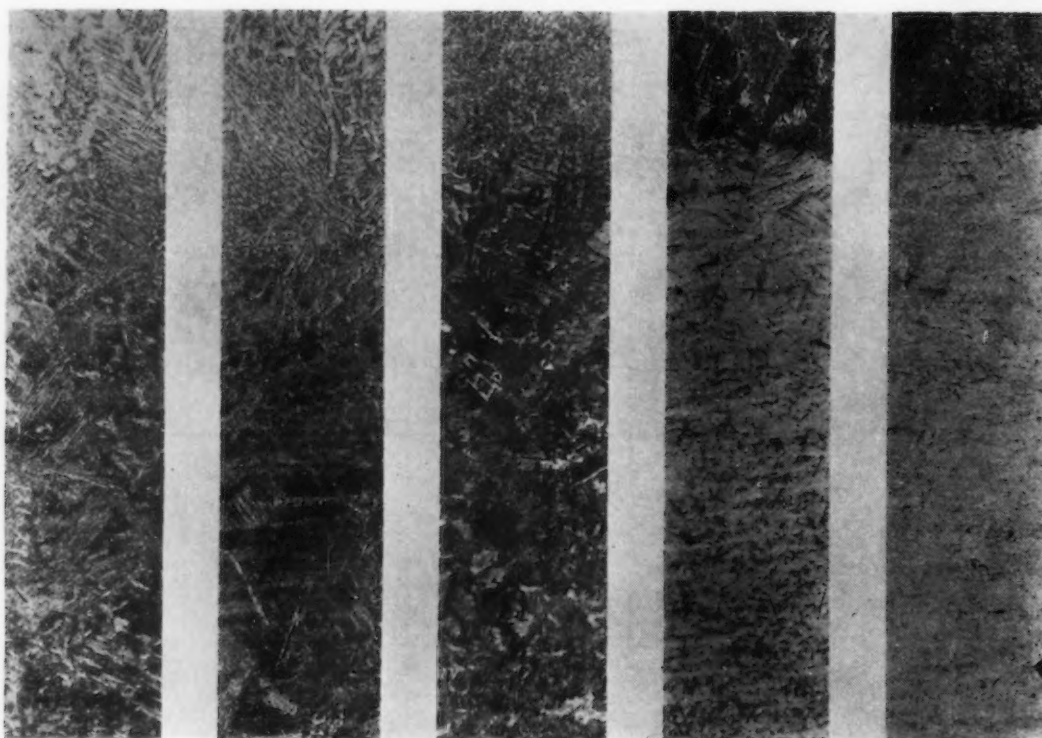


FIG. 10—SAE 4150 steel as welded. At 150 diameters. The five welding speeds range from sorbite and troostite at the slow speeds to solid areas of martensite adjacent to the weld at the higher speeds.

a groove of a heavy plate section, only a small quantity of molten metal is cast into the groove itself and against the large mass of plate. From a metallurgical viewpoint, the mold is too heavy for the amount of melt cast. The process of making a weld by depositing molten steel is, after all, the "pouring" of a melt against a mold which in this case is the sides of the vee. However, there is one notable

difference between casting in the open hearth and depositing a melt in welding; the liquid metal in an ingot mold is free to contract away from its sidewalls, whereas the weld bead is not, but must contract under the restraint imposed upon it by its adherence to the sidewalls into which it has been deposited by the penetrating power of the arc.

Molten steel poured into an ingot

mold will not freeze to the mold because of the rapid chill imposed upon the hot metal as it comes into contact with the mold. The thermal conductivity of the mass of the mold causes the melt to solidify immediately to form the skin of the ingot. From then on the cast ingot freezes from this outer shell in toward the middle of the ingot. Where large ingots are to be poured, thus requiring a large melt to

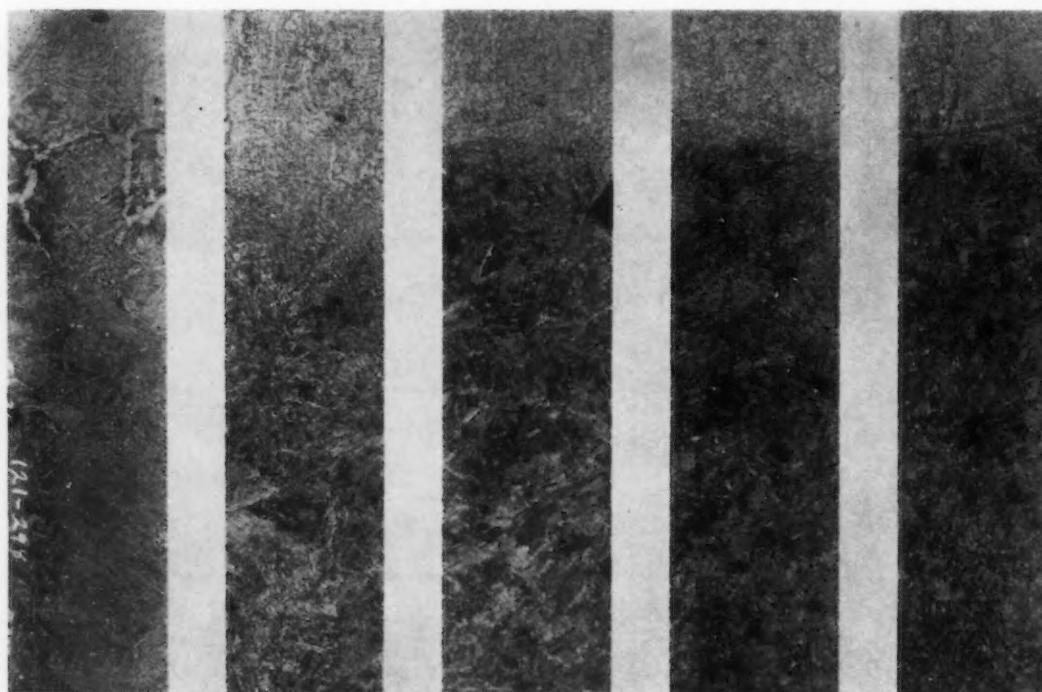


FIG. 11—SAE 4150 steel after stress relieving. Structure is now made up of sorbite for all welding speeds.

be cast into one mold, the capacity of the mold is increased of course, but the walls are also made much thicker. If the ingot molds were heated to a bright red heat and the melt cast into them, it is reasonable to expect that the chilling action of the walls would be reduced to a point where fusion of the cast metal to the walls would take place.

It seems sensible to draw an analogy between the pouring of an ingot and the deposition of weld metal, and for the welder to take into account the chilling action of a thick plate on his weld. Although the effect he wants

to bring about, namely the fusion of his melt to the base walls, is the opposite of that desired in casting an ingot, the same principle may be employed by heating his "mold" so that penetration and fusion into the plate metal take place.

Keeping the heavy-walled vessel warm during welding not only assists penetration and lessens the chill; it also increases the ductility of the metal and thereby lowers the strain put on it by the cooling weld deposit. In addition, preheating also allows a more uniform cooling between the joint and the surrounding plate or ad-

jacent members where, at times, failure may be due to differences in the rate of cooling between the welded area and the adjoining section or between abutting sections of different thicknesses.

As the tensile strength and the thickness of the plate being welded into a vessel increases, the need for keeping the entire structure warm until the welding is completed becomes of increasing importance. The maintenance of 400 deg. F., for a 4-in. thick weldment throughout the entire time of welding has, on several occasions, eliminated costly experiences.

Copper-Chromium Alloys

THE historical development of copper-chromium alloys was sketched by Mr. Corson last week. A description was given of large test castings prepared to study the physical properties of the alloys, both in the as-cast and the heat treated conditions, and discussion of experimental results so obtained are continued in this concluding section of the article. Also detailed variations of physical characteristics throughout the castings are given in the tables shown herein.

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EACH section was tested for its density before delivery to the machine shop. The tests themselves were made on a Baldwin Southwark testing machine and a partial

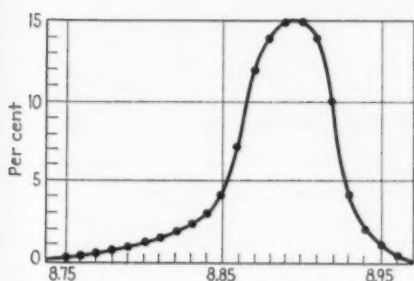


FIG. 2—Probable frequency of the density figures if 100 observations are taken at various locations

• • •
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stress-strain diagram was constructed from extensometer readings. From those diagrams the moduli of elasticity, the limits of proportionality and the stresses at 0.01 per cent and 0.1 per cent permanent deformation (proof stress) were computed. Finally, the data available were arranged in the shape of six tables shown here. The tables IA, IIA, and IIIA pertain to the "as cast" state; the IB, IIB and IIIB to the heat treated state.

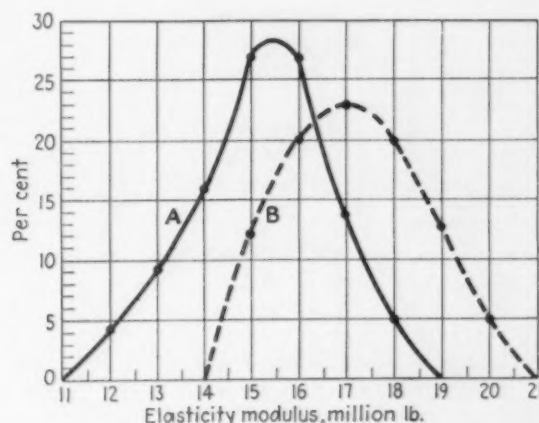
One hundred and seven determinations for specific density were made.

Three of the bars (IA, IB and IIA) have shown no shrinkage effect or very little of it, even the central bar of the top section having a high density. In three others (IIB, IIIA and IIIB) the shrinkage effect was quite distinct in the upper section and in the bar IIB in the lower section as well. This shows that copper-chromium is likely to possess a piped core—just like every other alloy does, and that on the other hand this piped state is not a necessary evil but can be avoided.

Otherwise the densities ran close enough. Fig. 2 shows the probable frequency of various density figures if 100 observations were taken at various locations in a reasonably heavy casting.

It is evident that values beginning with 8.75 and ending with 8.97 can be expected. However, fully 78 per cent

AT RIGHT
FIG. 3—Probable frequency of the elasticity modulus, with the metal in the as-cast state.



of the observations may show a density between 8.87 and 8.92. And with the density of pure copper being given variously from 8.94 to 8.96, it is evident that copper chromium castings are likely to be quite dense. What porosity remains is probably due to piping and to intergranular shrinkage which hardly can be completely eliminated. Copper-chromium castings seem to be truly free of gas holes, and this without the use of any complicated melting technique.

Mechanical Characteristics

Regarding the moduli of elasticity, see Fig. 3. In the as-cast state the moduli of elasticity run apparently from 11 to 19 million lb. per sq. in. The most probable value is 15 to 16 million lb. per sq. in. Fully 56 per cent of observations are likely to fall between these two figures. Lower and higher values are located symmetrically on both sides of the region of maximum probability.

Precipitation hardening shifts the curve to the region of higher elastic

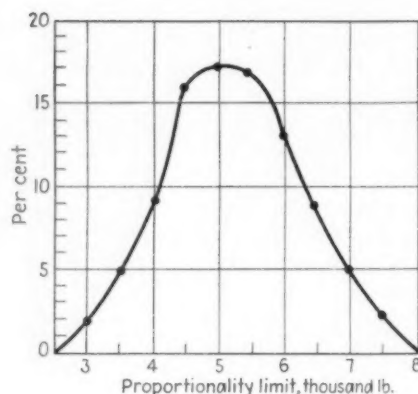


FIG. 4—Probable frequency for the proportionality limit of the metal when in the as-cast state.

moduli. However, the curve is much flatter. Forty six per cent of observations will show probably a modulus of elasticity of 16.5 to 17.5 million pounds. The minimum figure will be 14 million pounds and the maximum close to 21 million pounds.

Regarding the proportionality limits, see Fig. 4. In the as-cast state

the proportionality limit is likely to be quite low. The range is 2500 to 8000 lb. per sq. in. About 53 per cent of the observations are likely to show between 4500 and 5500 lb.

A frequency curve for proportionality limits in the heat treated state can not be presented, because samples IIB were deficient in chromium and did not harden to the same extent. This left too few data to warrant the construction of a frequency curve not too "overfitted". It can be stated, however, that the proportionality limit will not drop below 19,000 lb. per sq. in. and may go up to 26,000 lb. The average and most probable figure is 22,000 lb. per sq. in.

This high proportionality limit is a unique characteristic of copper-chromium alloys. Not even a heat treated aluminum-bronze of the kind that still retains sufficient ductility will show it. And while certain high tensile brasses may exceed it many times, they belong to an entirely different class of alloys and serve thoroughly different purposes.

TABLE IA
(Copper-Chromium Alloy, As-Cast)

UPPER SERIES				LOWER SERIES		
8.88	8.89	8.84		8.90	8.88	8.90
8.89	X	8.82	SPECIFIC DENSITIES	8.88	8.90	8.90
8.89	8.88	8.94		8.89	8.90	8.88
15.3			ELASTIC MODULI (in 1,000,000 lb. per sq. in.)	11.7		
12.8	X	15.5		15.0	15.7	17.5
14.3				13.4		
6.2			PROPORTIONALITY LIMITS (in 1000 lb. per sq. in.)	4.7		
5.7	X	5.5		4.5	5.0	3.0
7.0				5.7		
9.3			PERMANENT STRESS AT 0.01 PER CENT ELONGATION (in 1000 lb. per sq. in.)	8.5		
9.2	X	8.5		6.9	7.0	5.6
10.0				7.8		
?			PLASTIC STRESS AT 0.1 PER CENT ELONGATION (in 1000 lb. per sq. in.)	?		
12.0	X	?		9.8	10.6	10.0
?				?		
30.7	35.5	11.5	ULTIMATE STRENGTH AND IZOD COMPACT (in 1000 lb. per sq. in. and in ft.-lb.)	34.2	32.0	25.0
31.0	29.0	25.2		32.5	28.3	32.1
32.3	32.0	30.0		32.7	30.0	27.5
33.0			PER CENT ELONGATION in 2 in.	35.5		
32.0	32.5	15.0		39.0	31.0	39.0
31.5				36.5		
58.0			AREA REDUCTION in per cent	50.0		
62.0	68.0	22.0		58.0	63.0	47.5
50.0				47.0		

TABLE IIA
(Copper-Chromium Alloy, As-Cast)

UPPER SERIES				LOWER SERIES		
8.89	8.89	8.89		8.87	8.87	8.87
8.87	8.80	8.88	SPECIFIC DENSITIES	8.87	8.88	8.88
8.84	8.84	8.87		8.87	8.87	8.89
18.2			ELASTIC MODULI (in 1,000,000 lb. per sq. in.)	16.7		
16.0	16.0	16.2		17.9	14.7	15.4
16.0				16.0		
5.0			PROPORTIONALITY LIMITS (in 1000 lb. per sq. in.)	4.0		
7.5	4.0	4.0		3.5	6.0	4.0
7.0				4.5		
8.3			PERMANENT STRESS AT 0.01 PER CENT ELONGATION (in 1000 lb. per sq. in.)	8.0		
11.0	8.8	8.5		7.5	8.3	8.0
10.0				9.2		
12.8			PLASTIC STRESS AT 0.1 PER CENT ELONGATION (in 1000 lb. per sq. in.)	10.7		
?	11.5	12.6		10.7	11.3	10.8
13.5				12.3		
32.1	22.0	33.0	ULTIMATE STRENGTH AND IZOD IMPACT (in 1000 lb. per sq. ft. and in ft.-lb.)	33.0	24.0	34.0
31.9	25.7	33.4		32.8	33.5	33.8
30.5	23.0	32.0		33.3	22.0	30.0
23.5			PER CENT ELONGATION in 2 in.	24.0		
17.0	11.0	33.5		31.0	27.5	30.5
17.5				33.5		
32.0			AREA REDUCTION in per cent	36.0		
34.0	22.0	39.0		35.0	32.0	48.0
38.0				48.0		

No other precipitation hardenable copper alloy known so far will show such a high proportionality limit unless its copper content drops way below 99.0 per cent.

Whether this proportionality limit may be exceeded by the limit of endurance or not can not be told at present. It seems, however, quite certain that copper-chromium alloys in their cast and heat treated state may safely carry a load corresponding to 17,000 lb. of maximum fiber stress.

We leave it to the reader to compare other characteristics tabulated and limit ourselves to the discussion of those of ultimate strength only.

Fig. 5 shows the frequency curve for the ultimate strength figures observed in the cast state. These figures range from 24,500 to 35,000 lb. per sq. in. However, very few observations might be expected to appear in the case of the low values, while 51 per cent of them may show between 31,000 and 33,000 lb. per sq. in. In other words the ultimate strength of cast copper-chromium is likely to coincide

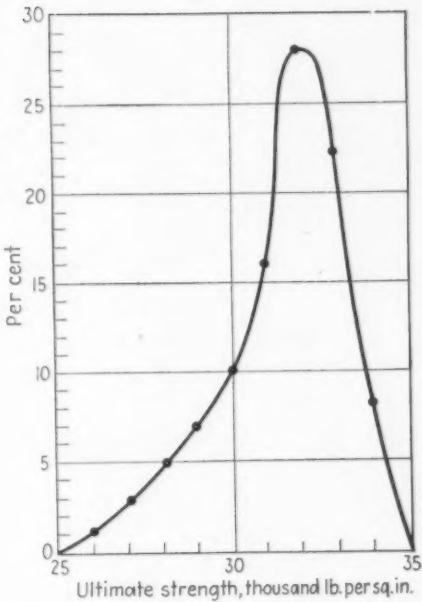


FIG. 5—Frequency curve for the ultimate strength figures obtained with the metal in the cast state.

with that of wrought thoroughly annealed pure copper.

Properly heat treated copper-chro-

mium castings will average 49,700 lb. tensile strength through their whole bodies, not dropping below 48,400 and rising to 51,500 lb. A bit less carefully treated, they will average 46,600 lb. with a maximum at 52,500 lb. and an incidental minimum of 34,000 lb.

Except for sections carrying an incidental pipe—and these seem to be quite rare—the heat treated alloy will possess an elongation between 15.0 and 24 per cent, the average being 20 per cent. Area reduction figures run between 20 and 38 per cent, the averages being 34 per cent for the best treated and 28 per cent for the moderately well treated samples.

Impact resistance in ft.-lb. absorbed is the most variable of the characteristics of copper-chromium castings. In the as-cast state it may vary from 22.0 to 45 ft.-lb. depending on the freedom of the metal from oxide inclusions and upon the location of the notch. Where the latter cuts a surface that was close to the surface of the cast bar, the figure of 30 to 35 ft.-lb. can be expected regularly, while 22 to 24 ft.-lb. will be

TABLE IIIA
(Copper-Chromium Alloy, As-Cast)

UPPER SERIES			LOWER SERIES		
8.87	8.92	8.87	8.88	8.90	8.94
8.90	8.54	8.96	8.91	8.92	8.91
8.89	8.89	8.91	8.91	8.92	8.87
SPECIFIC DENSITIES					
13.2			14.5		
13.0	X	?	14.7	?	14.0
15.0			13.8		
ELASTIC MODULI (in 1,000,000 lb. per sq. in.)					
5.6			5.5		
6.0	X	?	5.5	?	5.2
6.1			5.5		
PROPORTIONALITY LIMITS (in 1000 lb. per sq. in.)					
8.0			8.4		
8.3	X	?	9.5	?	8.2
8.7			8.4		
PERMANENT STRESS AT 0.01 PER CENT ELONGATION (in 1000 lb. per sq. in.)					
11.5			12.1		
12.0	X	?	14.0	?	12.3
12.8			12.4		
PLASTIC STRESS AT 0.1 PER CENT ELONGATION (in 1000 lb. per sq. in.)					
32.2	34.0	44.0	32.8	38.0	44.5
31.7	X	31.6	31.0	?	31.4
26.6	35.0	44.0	32.5	40.0	45.0
ULTIMATE STRENGTH AND IZOD IMPACT (in 1000 lb. per sq. in. and in ft.-lb.)					
42.5			31.0		
31.0	X	36.0	31.0	?	32.0
17.0			34.0		
PER CENT ELONGATION in 2 in.					
64.0			39.0		
62.0	X	38.0	67.0	?	73.0
39.0			68.0		
AREA REDUCTION in per cent					

TABLE IB
(Copper-Chromium Alloy, Heat Treated)

UPPER SERIES			LOWER SERIES		
8.90	8.91	8.87	8.87	8.94	8.91
8.91	8.87	8.75	8.91	8.92	8.93
8.90	8.88	8.75	8.89	8.91	8.90
SPECIFIC DENSITIES					
17.0			18.3		
17.1	16.6	16.1	19.7	14.9	15.4
16.0			17.4		
ELASTIC MODULI (in 1,000,000 lb. per sq. in.)					
25.3			26.0		
23.3	22.5	19.0	24.0	19.0	22.5
20.0			26.0		
PROPORTIONALITY LIMITS (in 1000 lb. per sq. in.)					
28.7			29.5		
24.5	26.0	24.0	29.0	25.3	28.5
24.5			31.0		
PERMANENT STRESS AT 0.01 PER CENT ELONGATION (in 1000 lb. per sq. in.)					
33.5			35.0		
33.5	31.0	30.0	35.5	29.0	32.5
31.3			35.5		
PLASTIC STRESS AT 0.1 PER CENT ELONGATION (in 1000 lb. per sq. in.)					
47.6	26.0	23.5	52.5	27.0	22.0
46.7	43.9	34.0	48.8	39.2	47.8
46.1	25.5	12.0	49.1	24.0	?
ULTIMATE STRENGTH AND IZOD IMPACT (in 1000 lb. per sq. in. and in ft.-lb.)					
22.5			19.0		
19.0	15.5	5.0	19.0	20.0	22.0
24.5			17.5		
PER CENT ELONGATION in 2 in.					
38.0			35.0		
37.0	43.0	14.0	34.0	45.0	44.0
41.0			36.0		
AREA REDUCTION in per cent					

TABLE IIB
(Copper-Chromium Alloy, Heat Treated)

UPPER SERIES			LOWER SERIES		
8.89	8.91	8.91	8.90	8.90	8.89
8.87	8.01	8.90	8.91	8.49	8.89
8.88	8.90	8.92	8.89	8.91	8.91
SPECIFIC DENSITIES					
15.3			19.4		
15.3	x	17.6	18.6	18.2	18.6
16.6			19.3		
ELASTIC MODULI (in 1,000,000 lb. per sq. in.)					
10.5			10.0		
15.0	x	14.0	12.0	3.5	14.0
15.0			12.5		
PROPORTIONALITY LIMITS (in 1000 lb. per sq. in.)					
21.0			17.5		
21.0	x	21.0	21.0	7.0	20.5
20.5			20.5		
PERMANENT STRESS AT 0.01 PER CENT ELONGATION (in 1000 lb. per sq. in.)					
27.0			26.8		
27.0	x	27.8	27.3	?	26.5
27.0			27.5		
PLASTIC STRESS AT 0.1 PER CENT ELONGATION (in 1000 lb. per sq. in.)					
43.2	15.0	27.0	43.8	14.5	22.0
42.2	x	42.9	44.3	22.3	44.2
43.9	16.0	23.0	44.1	15.0	26.5
ULTIMATE STRENGTH AND IZOD IMPACT (in 1000 lb. per sq. in. and in ft.-lb.)					
24.0			26.0		
22.0	x	14.5	14.5	1.0	17.0
21.0			18.0		
PERCENT ELONGATION in 2 in.					
28.0			26.0		
20.0	x	32.0	21.0	4.0	31.0
36.0			33.0		
AREA REDUCTION (in per cent)					

TABLE IIIB
(Copper-Chromium Alloy, Heat Treated)

UPPER SERIES			LOWER SERIES		
8.92	8.91	8.92	8.91	8.91	8.92
8.95	8.25	8.89	8.91	8.93	8.94
8.92	8.89	8.90	8.91	8.90	8.92
SPECIFIC DENSITIES					
16.0			18.7		
16.9	x	16.0	18.0	17.7	17.0
17.9			16.3		
ELASTIC MODULI (in 1,000,000 lb. per sq. in.)					
23.5			20.5		
24.5	x	21.5	21.5	19.7	19.5
24.5			19.5		
PROPORTIONALITY LIMITS (in 1000 lb. per sq. in.)					
26.5			23.5		
28.0	x	25.5	24.5	23.2	22.5
28.0			22.5		
PERMANENT STRESS AT 0.01 PER CENT ELONGATION (in 1000 lb. per sq. in.)					
32.5			28.5		
32.5	x	30.5	29.0	27.8	28.0
33.6			27.0		
PLASTIC STRESS AT 0.1 PER CENT ELONGATION (in 1000 lb. per sq. in.)					
51.1	36.5	48.5	51.0	41.0	54.5
49.0	x	49.0	49.2	29.6	48.4
51.5	38.0	43.0	48.8	46.0	52.0
ULTIMATE STRENGTH AND IZOD IMPACT (in 1000 lb. per sq. in. and in ft.-lb.)					
20.0			22.0		
15.0	x	20.0	17.0	4.0	19.0
16.0			24.0		
PERCENT ELONGATION in 2 in.					
32.0			36.5		
38.0	x	40.0	26.0	5.0	30.0
32.5			38.0		
AREA REDUCTION (in per cent)					

proper to notches cut on a surface distant from the cast surface. In most carefully cast pieces an impact resistance of 44 ft.-lb. can be expected in the case of an outside impact and 35 ft.-lb. for the other case. The bars are only bent, never broken in impact.

In the heat treated state impact resistance may drop to 15 ft.-lb., though most frequently it will remain between 25 to 30 ft.-lb. for an outside impact and 20 to 25 ft.-lb. for the other case. However, the properly treated bars will show from 40 to 50 ft.-lb. at notches cut at a distance from the cast surfaces and over 50 ft.-lb. at notches cut close to them. The heat treated bars never bend—always break clearly, and the figure of 50 ft.-lb. is most astonishing.

In conclusion it might be pointed out that castings in copper-chromium plus small amounts of silicon are comparatively easy to make and with proper care all shrinkage phenomena can be avoided. Articles so cast will possess rather uniform characteristics, the latter closely reproducing those of

the standard test bar. *This is because castings in Cu-Cr are practically free from liberated gas.*

Copper-chromium casting in the heat treated state may be relied upon to possess a proportionality limit of at least 19,000 lb. per sq. in. and could be loaded to 17,000 lb. maximum fiber

stress safely enough. Even a temporary stress of 23,000 lb. per in. sq. would cause no appreciable deformation.

Such castings may be relied upon to withstand a considerable amount of strong shock and under most careful practice this impact resistance can be doubled.

Large Steel Wind Tunnel Completed at M. I. T.

THE first steel pressure wind tunnel to be built in the United States, the new Wright Brothers wind tunnel, is shown in the accompanying illustration. Erected on the campus of the Massachusetts Institute of Technology by a group of prominent aeronautical scientists, the tunnel represents a progressive addition to aviation's experimental facilities. In keeping with the constantly increasing size and speed of modern aircraft, the tunnel is designed to permit simulation of flying conditions in the stratosphere

and to provide air stream speed effects beyond the capacity of wind tunnels heretofore available for commercial testing. Wind velocities up to 400 miles per hr. and pressures ranging from $\frac{1}{4}$ to 4 atmospheres absolute can be created during tests. Models having wing spread up to 8 ft. can be accommodated.

More than 200 tons of flange quality steel plates, from $\frac{3}{8}$ to 1 in. thick were used in construction, and all assembly was done by welding. The

(CONTINUED ON PAGE 84)



HARRY
JOHNSON

*For countless ages precious metals lay
In unrelated form and disarray
Quiescent in the womb of Mother Earth
Till questing man, triumphant, gave them birth.*

*Potential forces, undeveloped—still—
He energized and bent to serve his will;
Vulcanian treasures mixed with dross were
mined—
The alchemy transmuted and refined.*

*Now Titan steel mills thunder day and night;
Huge furnaces spew pyrotechnic light
In lurid, lambent flames, with sparks shot
through—
While seething caldrons mix their molten brew.*

*Steel, Silver, Copper, Iron, Bronze and Gold
Their myriad gifts no more from man withhold;
Art, Industry and Commerce gain new birth—
All suckled from the breast of Mother Earth.*

—J. M. Mackay

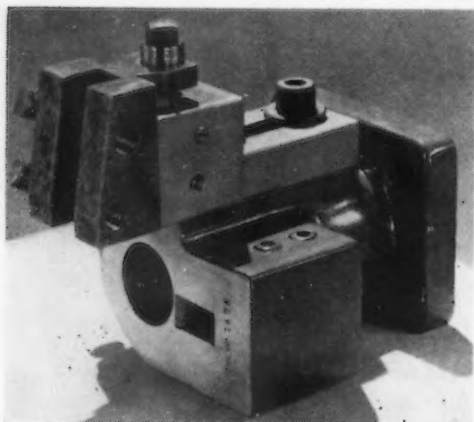
Recent Design Advances in Cutters,

A COMBINATION turning, boring and facing tool is being offered by the *Gisholt Machine Co.*, Madison, Wis., in which extreme flexibility is featured, permitting a wide variety of operations to be carried on simultaneously. Exact diameter size is obtained through the use of a micrometer graduated screw, and long or short turns may be taken on the diameter by adjusting the turning arm, which is mounted on a slide. A space block can be inserted under the turning arm to increase the normal turning capacity. Different size and shape cutters may be used in the large tool holding slot, which is provided with two well placed set screws. Drills, boring bars and facing bars can be carried in the center hole.

This tool bolts to the turret face and is made for use on Gisholt and other ram type universal turret lathes.

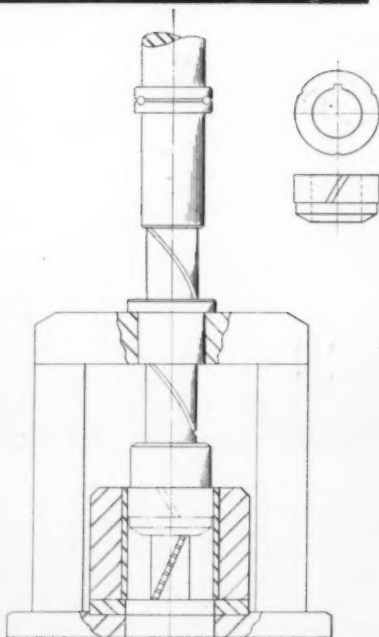
Rotary Files

A COMPLETE line of hand cut rotary files, hand cut rotary rasps, milled cut files for drill presses and milled cut files for general use



BORING, facing and turning tools can be mounted on this universal tool holder for combining multiple cuts on a turret lathe. The holder, made by Gisholt, is designed for bolting to the turret face.

A NUMBER of different tool mounts for combinations of cutter set-ups are described and illustrated; also several new threading and tapping tools. Among the small tools are included a tool marker, tube bender and wrench sets. A large amount of development work has taken place in instruments for inspection. A radically improved contour projector is announced, as well as measuring machines of extreme precision, vernier calipers, dial indicator gages, and improved measuring tapes. Two applications of weighing scales for checking work are also illustrated.

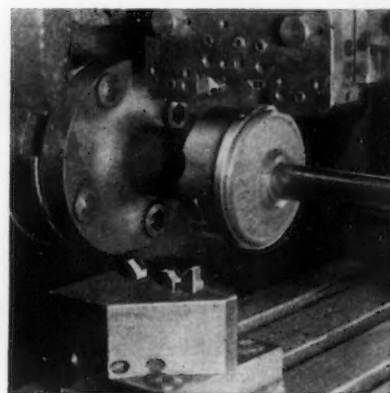


HELICAL oil grooves on guide bushings are being broached with this special fixture developed by Colonial Broach Co. The work is pushed through the fixture by the ram of a utility press. The ram has a helically grooved extension separated from the upper part by a ball thrust bearing and this groove mates with projections in a stationary guide bushing in the top of the fixture, causing the bar to rotate and turn the part by the engaging keyway shown. The broaches are built into the fixture and the work drops through the bottom upon completion of the stroke. Broaches consist of helical inserts on the desired lead.

has recently been placed on the market by the *Grobet File Corp. of America*, 3 Park Place, New York. The four classes of files are made in either high speed steel or chrome steel and are completely described in catalog R-13.

Combination Threader and Tapper

AN unusual threading tool has been developed by the *Eastern Machine Screw Corp.*, New Haven, Conn., that makes it possible to thread and tap pieces on chucking machines, turret lathes and automatics at the same position, even though the pitches are different. Known as style SAM, the tool combines an H & G solid adjustable die head, using insert chasers, with a compensating tap holder. This tool holder provides the proper starting pressure for the external thread, after which the die head follows its own lead, independent of the tap, which may be of finer or coarser pitch. By locating the tap in the holder in proper relationship to the die head,



SEVEN Carbide cemented carbide tools face four surfaces and chamfer three surfaces on a cast iron part at the rate of over 300 pieces an hour. Because the tools need be ground only once a week—every 25,000 parts—it is estimated by the user that the tools paid for themselves in 13½ hr., and that by the time they wear out they will have saved \$9,000 in tool costs, grinding costs, down-time and machining costs.

Small Tools

By FRANK J. OLIVER
Associate Editor, *The Iron Age*

and Inspection Equipment

both threads can be finished and reversed simultaneously.

Composite Knife Stock

WELDING of a high speed steel insert to a mild steel or low alloy steel backing has always been a problem, particularly for the vertical part of the weld which often has an unsightly appearance due to irregularities. The *Jessop Steel Co.*, Washington, Pa., is now using the Armstrong method of electro-pickling in conjunction with the assembly of high speed steel knife blade inserts. This process

assures the deposition of Fe onto the insert prior to assembly by welding. As shown in the sketch, further assurance of a proper vertical weld is given by slanting the plane *ABEF*, the amount of bevel generally being 15 deg.

Although intended primarily for knife stock, the R-type composite steel, as it is designated, may be used for other applications, such as lathe tools and dies. High carbon, high chrome steel as well as high speed steel can be used for the insert material, and almost any grade of backing steel can

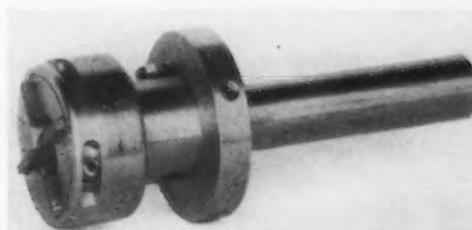
be employed, although the SAE 6130 backing steel shown in the sketch has proved considerably more satisfactory for knife stock than SAE 1010 or 1020 because of its greater toughness and comparative freedom from grain growth during hardening.

Electric Marker

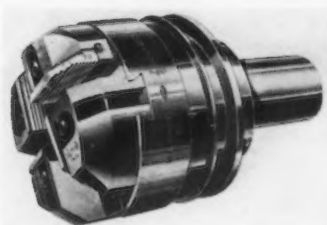
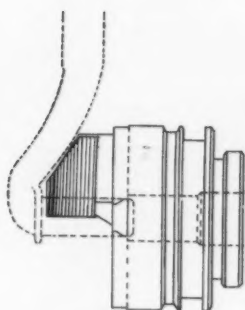
FOR placing identification marks on steel, cast iron, non-ferrous metals, plastics and ceramics, an improved electric marker of the vibrating hammer type is being made by the *Ideal Electric Commutator Dresser*



A-MOL hacksaw blades, made from a special molybdenum steel by E. C. Atkins & Co., 406 S. Illinois Street, Indianapolis, are available in all standard sizes, lengths and widths for hand and power use. There are nine hand blades, 10 and 12 in. and of 18, 24 or 32 teeth to the inch. There are 32 different power blades ranging from 12 to 24 in. long, 1 to 2 in. wide and 4 to 14 teeth per inch.



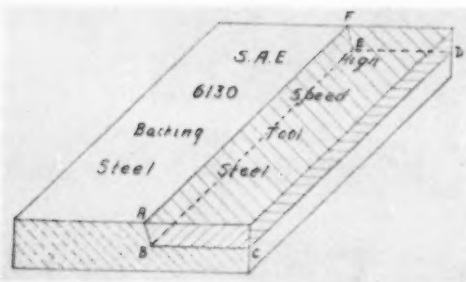
THE H & G solid adjustable die head, known as style SAM, using insert chasers, has been combined with a compensating tap holder, making it possible to thread and tap simultaneously.



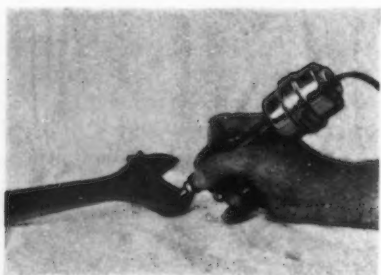
SPECIAL application of a Landis (Landis Machine Co.) $\frac{3}{8}$ -in. type L die head to threading the front wheel upper control arm of an automotive knee-action assembly. Because of the sharp bend of the steel forging immediately back of the threaded section, the special wide chasers are milled off at an angle to clear this bend. Likewise, the chaser holders are beveled to eliminate any interference during the threading operation.



LARGE size tap made by the Landis Machine Co., Waynesboro, Pa., for producing the screw mechanism for operating the control gates of a large dam in the West. This special 5-in. tap, with replaceable chasers, will be used for finishing and sizing the Acme threads after they have been roughed out on a lathe. Pitch is $\frac{2}{3}$ in.; lead, $1\frac{1}{3}$ in.; and depth 0.346 in. The tap body is 30 in. in overall length, made of alloy steel, heat treated and ground all over. The chasers are held by means of hollow head set screws.



THE Armstrong method of electropickling is used to insure a clean vertical weld on the area ABEF on Jessop R-type composite or "laid" knife stock.



AS an added feature, a special diamond point is available for engraving extra hard materials up to 60 Rockwell with the new "Ideal" electric vibrating marker.

Co., 1925 Park Avenue, Sycamore, Ill. The tool operates at a speed of 7200 cutting strokes per min. and plugs into any 110-volt lighting circuit. Weighing only 19 oz., it is regularly furnished with a hardened steel point, but a special diamond point for marking hard materials up to 60 Rockwell can be had at extra cost.

Tube Shaping Tool

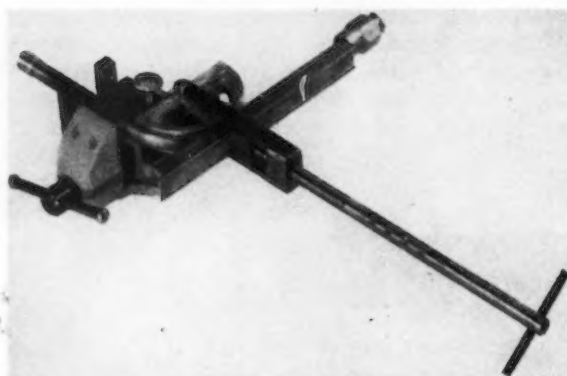
COPPER, brass, aluminum and other soft temper tubing can be safely bent by means of a combination tube shaping tool, made by *Sac Tool Mfg. Co.*, 1907 Washington Avenue, St. Louis. With the same tool, the tubing can be flared and swaged, or adequately supported for sawing with a hacksaw without distortion. The sawing capacity is up to 2½ in. o.d. One tip is used for all sizes of flares, but a separate tip is used for each size of swedge. The detachable handle carrying the flare or swedge tip is forced into the tube by turning a screw handle.

This tool can be employed to make coils, fittings and reducers or increasers. Duplicate shaped bends can be made by the aid of slides marked to show the length of tube required to make the bend. The circular blocks shown for use in the bending operation are adjustable to allow a bend to

be made back of a flare nut. Blocks come in ranges to cover bends from ½ to 2½ in. radius.

Wrenches

TORQUE Measurrench No. B-21 is the name given a new tool for measuring right-hand turning torque, recently announced by *J. H. Williams*



& Co., 75 Spring Street, New York. It is equipped with various sizes of detachable socket bits for tightening hollow set screws with ⅛ to 5/16-in. hex drive opening, and its purpose is to prevent overtightening. The Measurrench is calibrated with numbers corresponding to the bit size numbers, and when the index line on the bar touches the line indicating the bit number in use, the proper turning load has been reached. By moving the head along the bar, the tool may be transformed into a conventional sliding T-handle wrench without the measuring feature.

Another *Williams* development is a set of detachable Supersockets for use with hollow set screws. This set, composed of 10 bits, as well as parts and handles is designed to replace the L-shaped wrenches of hex bar steel. The new bits have a knurled end for fast spinning by hand until the screws become tight, and the set contains two

reversible Superratchet handles and the new torque Measurrench mentioned above.

Contour Measuring Projector

PRACTICAL elimination of optical distortion through means of a completely redesigned lens system is the chief claim for the new *Bausch & Lomb* contour measuring projector. The projection lenses approach in actual performance, it is said, the limits set by the basic laws of optical science. The result is that the images formed in this projector are characterized by a higher degree of geometrical truthfulness, brightness and edge sharpness than those formed by any previous model. Magnifications from 10X to 100X may be had, with corresponding fields of 1.80 to 0.18 in. (Max. diam. to fill the screen.)

AT LEFT

WITH the Sac tube shaping tool, copper, aluminum and other soft temper tubing can be bent, cut, flared and swaged. The tool is shown completing a 90-deg. bend.



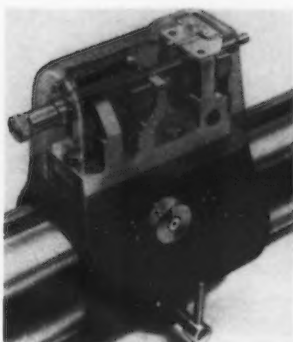
WILLIAMS Torque Measurrench No. B-21 is designed to prevent overtightening of hollow set screws.



NEW Supersocket wrench set made by Williams for use with hollow head screws.

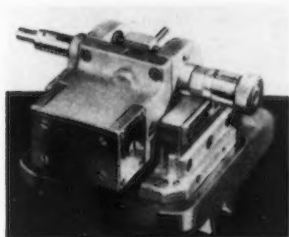
AT RIGHT

PHANTOM view of the new pressure recording tailstock of the improved P & W Super-micrometer, showing how the spindle is carried on flat vertical springs. Linkage transmits the spindle motion to a pointer moving across a zero point on a scale. Measuring pressures of 1 or 2½ lb. are obtained by setting the knurled knob at the left.



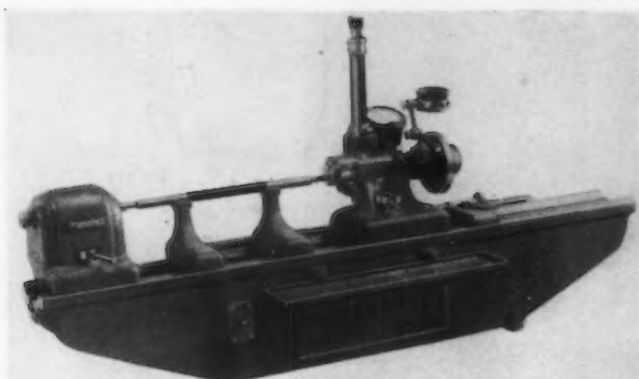
AT LEFT

BACK of the Electrolimit pressure tailstock, showing the balanced coil unit. An armature mounted on a flat spring pivot floats between two electrical coils, and any slight movement of the anvil spindle causes the armature to move, unbalancing the magnetic field and inducing movement of the micro-ammeter needle.



BELOW

P & W Standard measuring machine with Electrolimit pressure tailstock and micrometer dial reading to 0.00001 in. (See detail below at left).



ment in precision measuring, since it permits the duplication of any measuring pressure from 1 to 2½ lb. in ½-lb. increments. The heavier pressures are particularly useful in measuring large threaded pieces by the three-wire method.

In using the measuring machine, the

The projector cabinet is divided into three parts. The upper part is a welded steel hood within which the light beam passes to form the shadow image on a translucent screen in front. The lower front compartment houses the motor driven focusing mechanism, lamp housing and transformer, while the rear compartment is storage space. The lower front wall is a heavy casting with dovetail guides to which is

fastened the hollow knee casting. Passing through the centroid of the knee is the reversible motor driven elevating screw.

The work table on the knee is horizontal and the light beam passes through the plate glass rest vertically, so that no auxiliary holding devices are needed for many objects. However, there are V-grooves and T-slots in the upper surface of the table for attachment of V-blocks, screw thread holders and the like. Handles for the operation of the cross-slide table are at the front and right side, and accessories may be had for measuring objects to an accuracy of 0.0001 in.

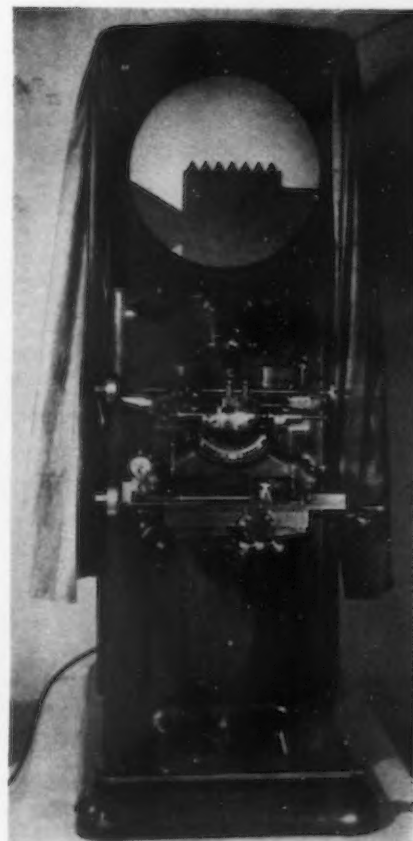
Several types of focusing screens are available, including a plain 18 x 18-in. square ground glass, or a round protractor screen 18 in. in diameter. The latter is provided with a vernier reading to 1 min. of arc. Fine, broken reference marks are etched on the glass for angular measurement of the image.

Standard Measuring Machine

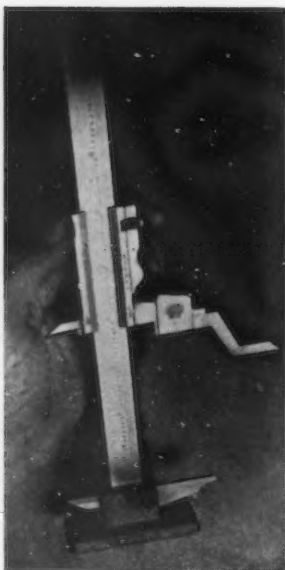
AN Electrolimit pressure tailstock for controlling measuring pressures is one of the features of a Standard measuring machine, made by Pratt & Whitney, Division Niles-Bement-Pond Co., Hartford. It is designed for checking gages and reads directly to 0.00001 in. Use of the Electrolimit tailstock has eliminated the human ele-



CUP point set screws are now being supplied by Standard Pressed Steel Co., Jenkintown, Pa., with knurling all around the cup. When turned into place, the knurled edges effectively grip the shaft in such a manner that loosening is said to be practically impossible, except by the application of a wrench. The knurled edges can not harm the threads of the tapped hole, so that the screw can be reset many times.



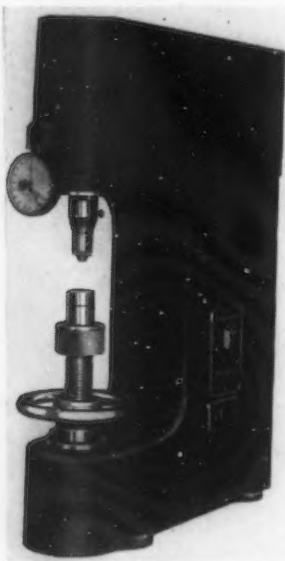
BAUSCH & LOMB'S new contour measuring projector shown with the protractor screen and screw thread measuring attachment. A new system of lenses is said to eliminate all optical distortion.



MAUSER combination vernier caliper and height gage, featuring a quick-action cam lock and fine adjusting screw for setting to close limits.

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dividing screw on the measuring head presses the work against the tailstock anvil until the pointer of the Electro-limit micro-ammeter reaches the center of the scale, at which time the size reading is taken on the large micrometer dial on the end of the dividing screw. In connection with the latter

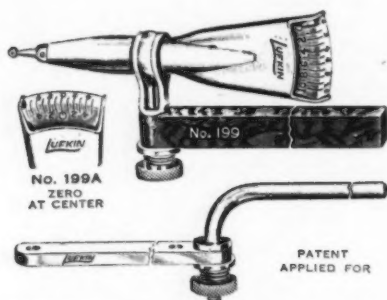


WITH automatic feed, 2580 hardness tests can be made per hour with the model PR Pyro-Universal direct-reading hardness tester, supplied with both a diamond penetrator and indentation balls of steel and brass.

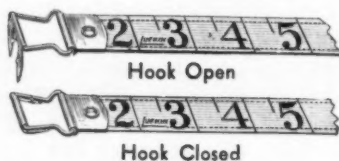
there is a master bar graduated at 1-in. intervals with extremely fine lines that can be viewed only through a microscope, mounted on the measuring head and containing a hairline graduation in the objective. Machines may be had in bed lengths corresponding to capacities from 12 to 80 in.

Supermicrometer

PRATT & WHITNEY has also improved its Supermicrometer, sensitive to 0.0001 in., which has been in use in production shops for some years, by the addition of a pressure tailstock operating on mechanical rather than electrical principles as in the Electrolimit tailstock. The machine consists essentially of a heavy barrel,



LUFKIN'S new universal indicator can be read both on the flat side and on the end of the fan gage.



A FOLDING steel hook permanently affixed to the tape ring makes it possible for one man to make many measurements unassisted. When not in use, the hook is folded flat against the tape ring. Each prong has an anchor spur and takes a firm, square hold at the zero line. This hook is a new, optional feature on woven measuring tapes made by the Lufkin Rule Co.

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a micrometer headstock with 1-in. spindle travel, and the pressure tailstock. The accuracy of the instrument depends upon the measuring screw and standard inches (in the form of hollow cylinders). The pressure device provides either 1 or 2½ lb. pressure against the work, the lighter pressure being used when measuring fine pitches. The measuring range of this unit is 9 in.

Vernier Caliper and Height Gage

THE George Scherr Co., 128 Lafayette Street, New York, is now handling an improved Mauser measur-



BLACK graduations are used on a crack-proof white surface, easy to read, on a new Wyteface steel tape made by Keuffel & Esser Co., Hoboken, N. J. Elimination of the usual etching process leaves the steel at full strength. This tape sells one-third lower in price than previous models. It comes in a black leatherite case with nickel plated mountings, and is offered in 25 to 100 ft. lengths.

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ing tool that may be used as both a vernier and a height gage. The improved feature is a combination quick acting cam lock and fine adjusting screw, which allows measurements in thousandths or 1/128ths. This model 407-R has a measuring capacity of 6¼ in. It comes with a lapped steel base and scriber attached to the caliper jaws for use in converting the instrument into a height gage. It also has two knife edges for layout work and measuring distances between holes.

Hardness Tester

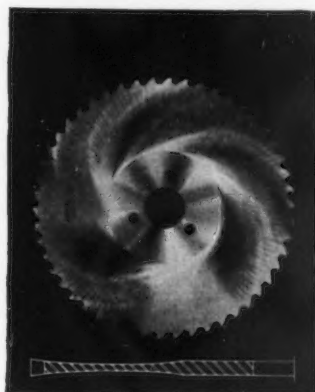
MODEL PR Pyro-Universal hardness tester is a direct-reading production instrument giving compar-



THIS attractively modern Toledo checking scale has been styled by Harold Van Doren Associates. For comparative weighing, it is sensitive to 1/64 oz.

ative C, B and A scale hardness numbers through the medium of diamond penetrators or 1/16 or 1/8-in. balls. Arranged for manual feed, 1920 tests can be made per hour, and with automatic feed, 2580. The instrument is powered by a fractional-horsepower ratiomotor. Major load readings (up to 150 kg.) of penetration depth are obtained under dead weight loadings, and adjustment of this load is effected by interchangeable calibrated weights. A minor load of approximately 10 kg. is constant and is applied automatically, thus speeding up the operation.

An elevating anvil compensates for variations in stock thickness in excess of 0.125 in. and is manually operated (except for automatic feed), but the handwheel shown is used only for the initial rough adjustment. Vertical capacity is 6 in.; throat, 7 in. This ma-



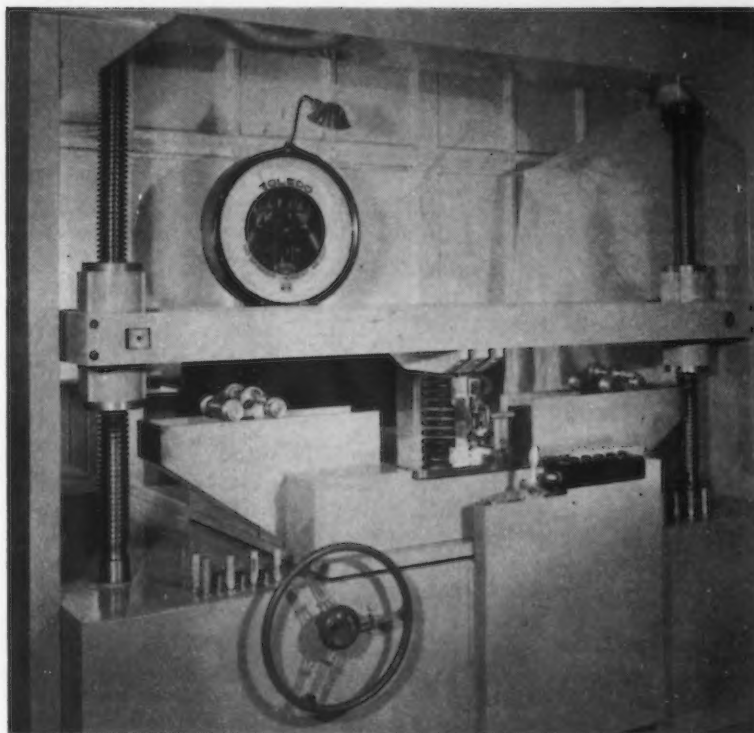
E. C. ATKINS & CO. of Indianapolis, is now using cup wheel grinding of circular metal cutting saws to provide clearance back of the line of tooth contact, thus allowing freer running and smoother cuts. The relief starts on the tooth point. Such saws can be used on any type milling machine for cutting ferrous and non-ferrous materials up to the hardness of tool steel. Chips do not freeze on the tooth point, but instead come off coiled like clock springs.

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chine is made by *Pyro-Electro Instrument Co.*, 7323 W. Chicago Boulevard, Detroit.

Universal Indicator

UNIVERSAL indicator No. 199, a product of the *Lufkin Rule Co.*, Saginaw, Mich., has rotating head, positive lock and reading faces on both the flat side and on the end or top, making the instrument suitable for jig boring and milling work. The indica-



CHRYSLER Corp. has put into service new apparatus for spring testing which measures 10 times more precisely than has been commercially possible before, according to Tore Franzen, the corporation's chief spring engineer. The apparatus, which is practically automatic, can be used to test coil or leaf springs up to 5250 lb. in a few seconds. It consists of a platform scale of the springless type, with the mechanical load applying system driven through a 7 1/4-hp. motor and reducer. The framework of the machine is built of standard structural steel shapes. Tracks are provided for leaf spring trucks which automatically center leaf springs of any standard size. For coil spring tests, the coil is mounted on a heavy steel plate in the center of the test table. A so-called vacuum contact tube is used to interrupt the current to the electric driving motor and thereby stop the load applying mechanism when the spring is compressed to a specified height.

tor makes a complete revolution on its own center and also on the clamping bolt, both movements being locked by a single thumb nut. With each unit is furnished a standard bar for general use and an attachment for use in drill chuck or in a surface gage. Contact point and all working parts are hardened, and the housing is of rust-proof metal.

Comparative Weighing Scale

A COMPARATIVE or direct weighing scale of 5-lb. capacity has recently been introduced by the *Toledo Scale Co.* It can be used in inspection work and other testing or packing. Styled by *Harold VanDoren Associates, Inc.*, Toledo industrial designers, the scale is attractively modern, and with the major exterior parts made of aluminum die castings, the weight is only 13 lb. The design incloses the lever mechanism, while at the same time providing wide-spaced load pivots of over size to assure rug-

gedness. The indicator in the center tower travels an inch to the ounce and registers variations as little as 1/64 oz.

Gage Block Reconditioning Service

COST of precision measurement will be reduced considerably through the extension of reconditioning service, by the *Johansson Division* of the *Ford Motor Co.*, heretofore available only for gage blocks of 5-in. size or larger, to *Johansson* blocks of 2, 3 and 4-in. size. Under a secret process, blocks that have become worn in service beyond their original accuracy can be renewed in most cases, thus virtually doubling their useful life at a cost considerably less than for new blocks. This reconditioning service is combined with an inspection service by which gage block sets are accurately tested for size and possible high spots. Blocks can be reconditioned and returned to the user in about one week.

Elevated Highway Described As Vast Future Outlet for Structural Steel

By T. C. CAMPBELL

CONTINUATION of improvement in volume of fabricated structural awards which began in March and a bright future for use of structural steel in elevated highways were forecast at the 16th annual convention, American Institute of Steel Construction, held at French Lick, Ind., last week.

The prospective tonnage in addition to that which will be forthcoming in the present PWA program indicates a considerably larger volume of structural steel tonnage in the immediate future, according to T. H. Hendricks, director of statistics.

In support of this view, Secretary of the Interior Ickes in his letter of greeting to the Steel Construction convention said:

"During the next 21 months, the new Public Works Administration program will make possible the expenditure of approximately \$1,600,000,000 for the construction of useful and permanent public works. Private contractors on several thousands of these projects throughout the nation will place orders for construction materials having a total estimated value of nearly \$900,000,000.

Third to Steel Industry

"The iron and steel industry will have an important part in this new program just as it has had in past programs. This great industry will be called upon to furnish almost one-third of the total value of materials to be incorporated in Public Works Administration projects.

"It is estimated that the entire program, including all types of projects, will require more than six and one-half million tons of iron and steel products. Building projects, consisting principally of educational, hospital and municipal buildings, will use more than two-thirds of the total tonnage. Sewer and water systems, depending largely upon the concerted efforts of local public bodies and this Adminis-

tration for the abatement of sewage pollution, will need more than one-eighth of these products.

Bridge projects, constituting the major portion of the heavy structures classification, will utilize nearly one-tenth of the tonnage of iron and steel purchased. The remaining tonnage, equal to a little more than one-tenth of the total, will be required for streets and highways, and a group of many types of projects such as garbage and rubbish disposal plants, gas and electric power plants, flood control, and reclamation projects, which in themselves are not of sufficient volume to list separately.

Pennsylvania Highway Outstanding

"It is significant to note that one outstanding project in the streets and highways classification will use about one-half of all the iron and steel for that group. This project is the \$58,000,000 toll highway to extend 165 miles from Harrisburg, in the central part of Pennsylvania, to Pittsburgh, in the western part of the same state. It is estimated that this project in itself, will require 34,000 tons of iron and steel products."

Lowell J. Chawner, chief, division of economic research, Bureau of Foreign and Domestic Commerce, Washington, said that residential building next year will be substantially larger than it has been during the past three years, possibly by as much as 40 per cent. He also said it appears likely that factory building in 1939 will be somewhat higher, possibly 30 per cent, than it has been during the past year. A considerable increase in the volume of electric light and power construction is also looked for, but in view of present unsatisfactory condition of railroad earnings, this type of work is not likely to be much higher than it has been during the present year.

Future of Elevated Highways

Considerable attention and interest surrounded a talk on improving high-

ways, by Dr. Miller McClintock, director, Yale University, Bureau for Street Traffic Research. In discussing the future of elevated highways and the economic aspects of them, as well as the saving of time and lives, Mr. McClintock cited a case where \$14,000,000 was used to widen a street in Detroit for a distance of only three miles, where had this same amount of money been expended in the construction of a modern elevated highway, 14 miles of such highway could have been completed.

It was stated that the same fundamentals that are involved in bridges or any other means of transportation, namely, the saving of time, operate just the same for the reasons behind the need for modern elevated highways. Some opposition to elevated highways has come from business men who fear loss of trade. However, speakers were of the opinion that this is due to a misconception of the modern elevated highway, since ample provision is made on all plans to take care of the merchandising situation. Several hundred miles of elevated highways are in the making, or at least in the planning stage, and will in all probability be constructed some time in the not far distant future. Such construction will utilize well two or three million tons of steel.

20,000 Bridges Obsolete

As an approach to the solution of problems involved in developing new markets, V. J. Brown, publishing director of *Roads and Streets*, offered the following: New higher strength structural steel, deeper rolled beams, rust resistant steels, lowering of factor of safety in design, and surface treated steels that will eliminate the cost of annual maintenance.

Major Brown said there were 20,000 obsolete bridges on the state highway systems, the replacement of which would offer a huge market. He warned, however, that continued vigilance must be exercised in combating the

cancer of the highway field—diversion of highway revenues. The steel producer and the fabricator, by cooperating in a battle against this menace, can not only render a service to his user but, incidentally, increase his own volume of business.

Interesting statistics on the structural steel industry were reported by T. H. Hendrix of the Steel Construction Institute, who said that for the first eight months in 1938, bookings totaled 679,793 tons against 1,202,019 tons for the same period in 1937, or a decrease of 43 per cent. Shipments, however, decreased only 33 per cent from a year ago during the first eight months. An analysis of the bookings for the first seven months of 1938 showed that Government buying (Federal, State and municipal) accounted for 51.2 per cent of the total sales in those seven months. This compares with 40 per cent in 1937 and 49 per cent in 1936.

Government Buying Changes

Mr. Hendrix pointed out, however, that Government buying has changed in character. Bridges and grade crossings have consumed 21.6 per cent of the structural steel production this year, dropping from 26 per cent in 1937 and 33 per cent in 1936. In the January to August period this year, it was reported that steel for industrial buildings had dropped to 16.6 per cent of the total as against 22 per cent for 1936 and 32 per cent in 1937. Commercial building on the other hand, for the first seven months of this year, has accounted for 13.8 per cent of structural bookings as against 6.7 in 1937 and 8.7 in 1936. In analyzing the breakdown of individual tonnages involved, Mr. Hendrix found that jobs involving 500 tons or less of structural steel, accounted for 47 per cent of the total bookings so far this year, compared with 46 in 1937 and 49 in 1936.

Jobs of 500 to 1000 tons have amounted to 13 per cent of the bookings so far this year, which is about the same as 1937. Jobs involving 1000 to 10,000 tons accounted for 37 per cent of the bookings so far this year as against 32 per cent in 1937 and 35 per cent in 1936. Large jobs involving more than 10,000 tons for the first eight months of 1938 decreased considerably and amounted to but 3 per cent of the total bookings, compared with 10 per cent in 1937.

Costs of Small Orders

A lively discussion resulted from a paper on the relative cost of small fabricated orders by Carl Blim, trea-

surer and general manager, Utica Structural Steel, Inc., Utica, N. Y. Direct cost figures including drafting, shop and material costs, were presented and discussed at great length. The consensus seemed to be that the cost situation would vary considerably throughout the country, depending on the labor rate paid, general overhead, and topography of the areas served, which many times results in non-productive work. It was fairly well agreed that, judging from the intense interest on the question of costs, everyone was making an effort to know more about them and exercise better control over them than heretofore.

One speaker emphasized, especially, that the small fabricator would do well both to himself and customer, if he would not place emphasis on the cost per ton of the job. It was his view that the type of work performed was more important than the total tonnage of steel involved, and he indicated that the salvation of the small fabricator could certainly be found in specialized jobs, many of which were not interesting to large fabricators and most of which could be served properly by the small fabricator.

Mullen Replaces Hirsh

Elective officers were reelected at the Steel Construction meeting last week and directors, whose terms expired, were reelected, with the exception of H. B. Hirsh, Belmont Iron Works, Philadelphia, who is retiring, and was replaced by T. R. Mullen, Lehigh Structural Steel Co., Allentown Pa.

A resolution was adopted at the Steel Construction Institute to create an award for the person who has contributed the most to the art of the design or fabrication or erection of structural steel. The recognition is not to be awarded more than once in any year and will be in the form of a gold medal to be named the Lloyd Kimbrough Medal in recognition of the first president of the American Institute of Steel Construction.

The location of next year's convention is yet to be decided upon. Several suggestions have been received by the committee in charge and one being given considerable thought is the holding of the convention on board a boat between New York and Bermuda. This suggestion, however, is by no means definite.

Czechoslovak Iron and Steel Industry Hampered by Split-Up

HAMBURG, GERMANY (By Mail.) — The splitting off in Czechoslovakia has affected the Czechoslovak iron and steel industry greatly. There are 11 major Czechoslovak iron and steel plants which in 1937 produced 1,675,000 tons of pig iron and 2,317,000 tons of steel. The steel output is mainly open hearth. There are 53 basic and 12 acid open hearth furnaces as well as 20 electric furnaces and only five bessemer furnaces.

Poland obtains by the occupation of the Teschen district rich coal mines and three iron and steel plants, Germany gets two, of which the Mannesman tube works of Komotau is the most important.

Nearly 90 per cent of the lignite production goes to Germany, but most of the pit coal production remains in Czechoslovakia. Of the iron and steel produced last year, 71.2 per cent remains in the new Czechoslovakia, but if the Slovak part is also split, no iron deposits will remain in Czechia.

With handing over of the Hungarian inhabited territory, 60 per cent of the

iron ore production goes to Hungary. The worst feature for Czechoslovakia is that all routes to and from go through German or Hungarian or Polish territory. For import of scrap Hamburg and Trieste (via Germany-Austria or the Danube) is the only way, for export German or Hungarian territory must be crossed. A hostile tariff policy would bring the whole industry to a standstill or at least reduce it to a very small impotency.

Rustless Iron Shipments' Dollar Value Climbs 66%

RUSTLESS IRON & STEEL CORP., Baltimore, reports net earnings of \$18,983.68 for the three months ended Sept. 30. This compares with net losses of \$62,651.20 and \$33,686.33 during the first and second quarters respectively. C. E. Tuttle, chairman and president, stated the dollar value of shipments for September was 66 per cent greater than the monthly average for the first eight months of the year.



HOWARD DINGLE, president, Cleveland Worm & Gear Co., and president, American Gear Manufacturers Association, in which he has been active for many years.

A WELL balanced program of technical and commercial papers and addresses, interspersed with golf and other outdoor recreation—the latter particularly enjoyable because of the best of mountain fall weather—marked the twenty-first semi-annual meeting of the American Gear Manufacturers Association, held at Skytop Lodge, Skytop, Pa., Oct. 10-12. In attendance the meeting almost equalled the record for the association.

Technical papers included the application of bronze to worm gearing; measurement and analysis of gear noises; characteristics of general-purpose motors; control of general-purpose motors; and application of gearmotors. Addresses on commercial topics included cost and profit trend charts; buying and selling; and industrial relations. The informal dinner on the evening of Oct. 11, with Col. Willard Chevalier, vice-president McGraw-Hill Publishing Co., New York, speaking on "Business Today and Tomorrow," was a high spot of the meeting.

The Newport News Shipbuilding & Drydock Co., Newport News, Va., was admitted to membership in the association.

The immediate trend of business is unmistakably upward, said Howard Dingle, president, Cleveland Worm & Gear Co., and Farval Corp., Cleveland, president of the American Gear Manufacturers Association, in an able address that opened the convention. Speaking of the association's statistics

Gear Makers Hold Large Meeting

on the volume of business in different branches of the gear industry, Mr. Dingle said that starting next January, opportunity will be given for additional members to participate. The ratio of the total volume of gear business in any one month to the average monthly volume of what might be considered a normal year is an index of gear activity, and a chart based on such percentages would show the trend of business as a whole. Such an index, Mr. Dingle believes, would be of interest not only to the A.G.M.A. membership but to the business world in general, for it would appear to be a better barometer, due to the great diversity of interests served by the gear industry, than many of the indexes now published. It is planned to release this monthly index figure for publication.

Mr. Dingle commented on the splendid work of the association's industrial relations, commercial, technical standards, and program committees, headed respectively by R. C. Ball, president, Philadelphia Gear Works, F. H. Fowler, president, Foote Bros. Gear & Machine Co., T. R. Rideout, engineer, Nuttall works, Westinghouse Electric & Mfg. Co., and U. Seth Eberhardt, Newark Gear Cutting Machine Co. In conclusion he pointed out that it is the duty of all members to cooperate with the Government in any effort being made to reduce unemployment. "In so doing, however, I do not think it disloyal or unpatriotic for us as an association or as individuals to go on record with our Government—local, state or national—as opposing any measures we do not believe are for the lasting good of our industry," he said.

The training of young men for shop work was advocated by R. C. Ball, in his report as chairman of the association's industrial relations committee. Notwithstanding the unemployment that prevails, it is continually difficult to secure skilled workers, he said. The system proposed is more especially for small gear plants, and it is thought that a course of instruction embracing 1½ years for learners

would most quickly meet the situation. A certain amount of time would be spent by the learner in each shop department, affording a well rounded experience which would make him useful and adaptable to every phase of shop operation. It is proposed that completion of this course in machine adaptation and operation be recognized by a certificate by the A.G.M.A., after the apprentice has been certified and approved by the operating officials of the company by whom he is employed.

An interesting address by Col. B. A. Franklin, business counsel, on "Modern Industrial Relations" was a feature of the same session.

Preparation and use of cost and profit trend charts were outlined by W. H. Compton, William H. Compton & Co., Trenton, N. J., at an evening session under the chairmanship of F. H. Fowler, chairman of the association's commercial committee. Discussion of the variable budget and its advantages was also an interesting part of Mr. Compton's paper.

A. G. Hopcraft, director of purchases of the Cleveland Worm & Gear Co. and of the Farval Corp., in an address on "Costs and Profits," discussed both purchasing and selling. His extemporaneous address included a number of stories that entertainingly illustrated his remarks. Principles of "buymanship" emphasized were: Faith in fair dealing; knowledge of field and of products purchased; skill and tact; knowledge of values; and ability to see ahead.

Diversity of Technical Topics

The several excellent technical papers at this meeting included "Application of Bronze to Worm Gearing," by J. A. Hatch, vice-president, McCallum-Hatch Bronze Co., Inc., Buffalo, N. Y. A section on bearings and their relationship to worm gears preceded discussion of gear bronzes in general. This was followed by an outline of the benefits of nickel in gear bronze, and a section on the addition of lead to bronze gears, and characteristics of the so-called strength alloys.



F. H. FOWLER, president, Foote Bros. Gear & Machine Co., Chicago. In addition to serving on the executive committee of the A.G.M.A., Mr. Fowler is chairman of the association's commercial committee.

The more prominent rivals of the nickel-tin bronzes in the worm gear field are, he said, aluminum bronze, manganese bronze, and to a much lesser degree, silicon bronze. Composition, strength and other data relating to these were given, and in conclusion some of the common causes of worm gear failure were briefly discussed. As to a method of selecting the proper bronze specification to use for worm gears Mr. Hatch said: "This can be briefly answered by saying that, granted that a high quality of steel is used, and approved workmanship employed, there can be no better rule to follow than to select the highest quality of bronze showing the lowest coefficient of friction and the maximum physical properties. With this combination of steel and bronze, combined with workmanship of a very high order, and with adequate lubrication, the worm gear will last indefinitely."

Analysis of Noise in Large Gear Sets

Noise measurement in general and the apparatus and methods used in the investigation of noise in large gear sets were covered in a paper by R. S. Davidson, Thomson Laboratory, and L. J. Collins, metal gear department, General Electric Co., West Lynn, Mass. The paper, entitled "The Measurement and Analysis of Gear Noises," includes an illustrated description of the G-E sound-level meter developed to provide performance in accordance with A.S.A. standards and also an analyzer unit, an accessory to

the sound-level meter, for determining the magnitude and frequency of the individual components of a sound. The combination of analyzer and sound-level meter was said to have a wide field of usefulness; in addition to providing the information for intelligent study of machinery noise, it may also be used to measure the harmonic content of voltages in electrical circuits. When used in conjunction with a vibration velocity unit and the sound-level meter, it permits harmonic analyses of vibrations to be made.

Other sections of the paper briefly discuss causes and characteristics of gear noises. In discussing the practical benefits of noise analysis, the authors stated that comparisons of



R. C. BALL, president, Philadelphia Gear Works, Inc. Mr. Ball is a member of the association's executive committee and also chairman of the A.G.M.A. industrial relations committee.

noise analysis with vibration tests on a gear wheel indicated the advisability of changing wheel dimensions with the result that a gear set with an objectionable whistle was made acceptable. "In one instance the acceptance of a very large gear set was facilitated by tracing an objectionable whistle to the commutator of the load generator used on test. This is an important point, as with several machines running in the same room it is easy to confuse extraneous noise with that of the machine under examination."

Proper selection of an electric motor to be used with a gear unit was discussed from a motor designer's viewpoint by M. S. Hancock, manager industrial motor engineering, Westinghouse Electric & Mfg. Co., in a paper

on "Characteristics of General-Purpose Motors." The entire problem of motor selection is the finding of an answer to the question: what is the least costly motor that will do the job? said Mr. Hancock. In this the price relation between various types of motors is an essential factor. In addition to the electrical performance characteristics of different types of motors, the paper includes discussion of various types of inclosures.

A paper on "The Control of General-Purpose Motors," by N. L. Hadley, industrial department, General Electric Co., supplemented knowledge of motor characteristics in a way that permitted better appreciation of the application possibilities of motors. The subject was developed from a functional point of view.

A variety of interesting applications of gearmotors was described and illustrated by R. S. Marthens, manager, Westinghouse Nuttall works, at the closing session, with T. R. Rideout, engineer, Westinghouse Nuttall works and chairman of the A.G.M.A. technical standards committee, presiding. The field of application of gearmotors is apparently limitless, said Mr. Marthens, for in all types of machine design and mechanical transmission of power, some form of speed reduction is required. The gearmotor, he pointed out, provides a very compact unit, combined with high efficiency, low cost, neat appearance, few wearing parts, long life and proper inclosure to meet safety requirements.



T. R. RIDEOUT, engineer, Nuttall works, Westinghouse Electric & Mfg. Co. For several years Mr. Rideout has headed the technical standardization activities of the American Gear Manufacturers Association.

THIS WEEK

ON THE ASSEMBLY LINE

By W. F. SHERMAN
Detroit Editor

*... Conjectures fly after Martin meets Ford and Bennett
... GM units recall workers as output tops 50,000 mark
for industry ... Scrap salvage provides material for hundreds of body parts.*

DETROIT.—Conjectures flew last week after Homer Martin, UAW president, had met and conferred with Henry Ford and Harry Bennett, Ford personnel director. And well they might for, despite avowals to the contrary, this meeting was full of significance for the Ford Motor Co., the UAW and even the most remote industrial plants in America.

The meeting of these key figures of the automobile industry was a surprise to other high officials of the Ford Motor Co., to Martin's own board of directors, and to even his immediate associates in his own suite of offices. It is said that of all the union officials and employees, only Larry Davidow, union attorney, knew of Martin's plans.

This unprecedented pow-wow was much more than the "mere social meeting" described in the daily press. It was carefully arranged and all the evidence shows that there were definite objectives on both sides, even though Homer Martin has declared that he went to Mr. Bennett's office just because someone had told him that he couldn't get past the Ford doors. A careful approach to the meeting is indicated by one of Bennett's comments after the meeting.

"We have checked Mr. Martin thoroughly," Bennett told a news writer. "Mr. Martin says he wants to help the unskilled working man. He says that is his one aim in life.

I believe, from what I have found out about him, that he is sincere in this. Otherwise I wouldn't talk to him."

Industry will want to know that the meeting with Martin wasn't the brief affair that perusal of the papers would indicate. The actual meeting with Ford is said to have lasted an hour and a half, not just long enough for a handshake. And, although Martin arrived about the noon hour, the best indication of the total time spent at the Rouge is his very late afternoon arrival at the General Motors Building to join a conference with officials there.

Ford Workers Join UAW

The most immediate reaction to announcement of the conference is, according to a union spokesman, an increase in membership applications from Ford workers. He claimed that about 10,000 of them are on the UAW rolls now in Detroit.

Now that the long-awaited Ford-UAW contact has occurred, many people are offering explanations. For instance, some declared that it may be paving the way for better understanding with the National Labor Relations Board, where Ford otherwise finds that the hearts are of stone.

Then there is the sales picture. The unions have quite definitely boycotted the Ford organization, possibly accounting for some of the shrinkage in Ford volume (and an 11.4 per cent

gap was opened between Ford and Chevrolet when the latter forged ahead in 1938. See Assembly Line, Oct. 6).

Another, and obvious, explanation is the threatening attitude of labor in the parts manufacturing field as indicated by the Motor Products Corp. sit-down strike last Wednesday.

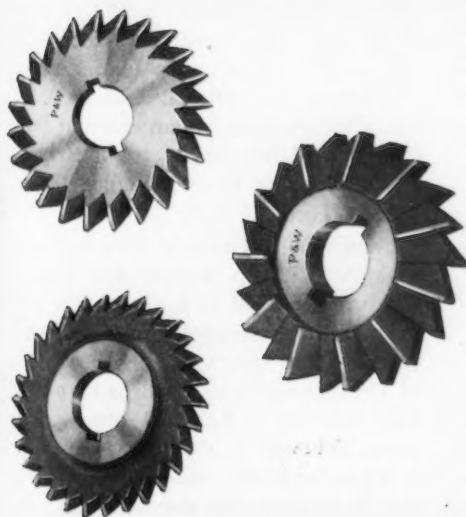
"That strike should have been settled in an hour," Bennett said. All during the day after workers had wired shut the gates of the Motor Products plant and cut off supplies of Ford automobile paneling, Bennett watched developments of the strike closely, as did Charles Carroll, assistant purchasing director of the Ford company. A report that some Ford Motor Co. official specifically asked the Detroit Police Department not to step into the picture is largely discounted by the fact that a small detail of police was assigned to the plant.

Cause of the strike, the union claimed, was a pay cut for some workmen from \$1.14 an hr. to 90c. an hr. after the installation of new machines.

Chrysler Concedes Demands

During the past week, the UAW, much revived after its "communist trial" and the disciplining and purge at the direction of CIO leaders, made distinct headway in its attempt to win a general 32-hr. work week. After weighing the problem a few days, Chrysler officials acceded to the union's demands. A similar proposal is under consideration by General Motors officials, but may not be pressed so seriously because GM units still are re-employing workers at a relatively rapid rate.

The critical situation in Chrysler plants was induced by the fact that the



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PRATT & WHITNEY

Division Niles-Bement-Pond Co. Hartford, Conn., U.S.A.

Chrysler pay roll had reached a static condition for a few weeks and non-working employees were afraid that they would never be called back. The recall of 4200 workmen to their jobs by Nov. 1 has been announced by two GM divisions in Flint. Chevrolet, already employing 9000 men, has requested 3000 more to report at the rate of 300 a day. Buick is summoning 1200 men at the rate of 100 a day. The Fisher Body Division No. 1 plant, which builds Buick bodies, has increased its force from 5400 to 5900 in the last few days.

Incidentally, the Buick production schedule calls for the building of 21,000 cars in October and 24,400 in November, with 14,700 chalked up in September. Output currently is running at the rate of 1080 a day, not including Canadian shipments. The Buick projected output of 62,000 units by the end of November is an increase of 7000 over original schedules.

Production Gains

Meanwhile, the industry's output for the last week topped the 50,000 mark for the first time since early

May. According to the estimate of Ward's Automotive Reports, production rose nearly one-third, to 50,540 cars and trucks, from the previous week's 37,665. A year ago the rate was 89,635. Ford turned out a total of 4075 units, including 3750 of the new Fords and Mercury. Chevrolet assembled 17,000 units and Plymouth again turned out 7000.

Sheet Clippings Salvaged

With an eye to economics, a number of the stamping plants in the automobile industry have been installing equipment to salvage sheet clippings and use this scrap steel for stampings. Fisher Body is said to have discovered nearly 190 small body parts which could be stamped from scrap after the scrap had been flattened out. In the Grand Rapids, Flint, Pontiac and Cleveland plants rolling equipment has been installed to process five tons of scrap an hour. The rolls, about 4 ft. long, exert a maximum pressure of 200 tons and remove all of the bumps and bends. Almost all of this material originally has deep impressions from the binder strips on the dies, so

the cold working really is quite extensive, making the material unsuitable for any further drawing operations. The small stampings made from the scrap are used for braces, gussets, angles and brackets.

Extensive changes are planned as a result of the installation of this equipment. First of all, there will be conveyors installed to carry the scrap to this special scrap roller and then to transport it to the smaller press where it will be used.

A change in dies will also be required. In cases where the clippings from the stampings are too long to be put through this 4 ft. roller, the material will be cut up when the stamping is trimmed. Cutters or shears will be incorporated in many of the dies next year.

There will be an effect on steel buying also. Studies made within the industry indicate that the process will make possible the purchase of more standardized sizes, with fewer sizes of sheet to be specified in the future. It will no longer be necessary to figure sheet size so close to the required blank size, although this formerly was done to eliminate waste. Obviously, less prime steel will be purchased. If a single machine can process five tons an hour, practically a carload of scrap a day, and if just one-half of this tonnage is stamped into small parts, the difference will be apparent to the steel vendor.

Along the Sub-Assembly Line

Away from home plate after years in baseball, Gordon S. (Mickey) Cochrane was seen about a week ago in the purchasing department lobby in the Ford Administration Building. Mickey is being seen a lot now around the auto plants since he became a manufacturers' representative. "He gets a lot more attention than us other peddlers do, at least out in the lobby," one of the clan commented. Mr. Cochrane is a special representative for the Dryden Rubber Co., 1014 S. Kildare Avenue, Chicago, and has an office at 906 Fisher Building, miles from Briggs Stadium, where he once managed the Detroit Tigers.

Confirming an earlier item in THE IRON AGE, it was learned that Chrysler has exercised its option for a 65-acre tract near Newark, Del. The land has a 2600-ft. frontage along the tracks of the Pennsylvania Railroad and is intended for a \$250,000 auto parts depot, although R. P. Fohey, secretary of Chrysler Corp., said that no plans had been made for the building yet.

THE BULL OF THE WOODS

BY J. R. WILLIAMS



Murray Warns Steel Industry To Place Its House in Order

THE Steel Workers Organizing Committee would like to see alleged competitive practices of the steel industry outlawed, prohibited by legislation if necessary, a statement by Philip Murray, SWOC chairman, indicated last week at Cleveland.

The union leader drew up the newspaper statement hastily while the reduction in sheet steel prices was a leading topic of discussion.

Murray talked of "chaos, chiseling in prices, rebates in commissions to customers," and said, "If the steel corporations cannot put their own house in order, it is the avowed purpose of organized steel workers of this nation to promote a constructive legislative program that will adequately protect the interests of the industry and its workers."

Fear Wage Cuts

Coming at the time of reduced sheet prices, the statement was interpreted by many persons as indicating the union's anxiety over the wage structure. In the past few months some non-integrated sheet producers with union contracts have been able to effect wage reductions of 10 to 25 per cent.

The idea of legislative action has been for some time a popular subject with some of Murray's associates in the SWOC.

Murray asserted that the Federal Administration should offer aid and cooperation to the industry "to avert the certain consequences which must follow from the present conditions." He said:

"The Steel Workers Organizing Committee, representing over a half million wage earners in the steel industry, and having 541 separate wage agreements with as many companies and corporations, views with apprehension the terror-stricken condition of the steel industry brought about by a system of cut-throat competition and resulting destroyed earnings.

"Chaos, chiseling in prices, rebates and commissions to customers are the order of the day. The position of the steel industry today may be likened to the position of the bituminous coal industry prior to the passage of the Guffey Coal Stabilization Act. Such practices are not leading to an added single work-day opportunity or to the reemployment of an additional worker.

"The cutthroat competitive practices

prevalent in the industry today are leading the nation away from the objectives of recovery and into a devastating economic tailspin. The present fallacy of price chiseling and price cutting, while giving a momentary appearance of competition, inevitably leads to more intensive monopoly, through the elimination of the smaller competitors.

"The people of the United States, and particularly the steel workers of the nation, are not prepared to accept

Industrial Congress Will Hear Andrews And Sen. O'Mahoney

CHARLES R. HOOK, president, National Association of Manufacturers, this week announced that the 1938 meeting of the Congress of American Industry, annual gathering of the nation's manufacturers, will be held Dec. 5-9 in New York.

Speakers will include Senator Joseph C. O'Mahoney, Wyoming, chairman of the Temporary Economic (Monopoly) Committee, and Elmer Andrews, administrator of the Fair Labor Standards Act. Many business men are also scheduled to speak before the Congress. The program includes a "Labor Day" when problems of employment relations will be discussed.

More Automobile Prices Are Cut

FURTHER price reductions on 1939 automobiles have been announced.

Dodge has announced reductions up to \$55. The standard coupe lists at \$756, delivered in Detroit, including Federal taxes, compared with \$808 last year. The two-door sedan will sell at \$815 compared with \$870 for the 1938 model, and the four-door sedan at \$855 compared with \$910 in 1938.

Price reductions ranging as high as \$68 were announced by Nash Motors. Nash factory delivered prices will range from \$770 for the Nash Lafayette special coupe to \$1,235 for

a formula which is again going to lead the country back into the economic morass in which it found itself during the dark days of 1930-31-32.

"We challenge the steel industry to assume leadership. The Federal Administration should offer its aid and cooperation to the industry to avert the certain consequences which must follow from the present conditions in the industry.

"If the steel corporations cannot put their own house in order, it is the avowed purpose of the organized steel workers of this nation to promote a constructive legislative program that will adequately protect the interests of the industry and its workers."

the biggest and most expensive automobile—the four-door, eight cylinder Nash Ambassador Eight sedan.

Nash Wisconsin Plants Resume

CHICAGO.—The Wisconsin plants of the Nash Motor Co. in Milwaukee, Racine and Kenosha are operating again following the solution of a labor dispute affecting 7000 employees. Settlement was held up because of difficulty in adjusting the seniority question.

Allis-Chalmers to Recall 850 Workers

ALLIS-CHALMERS MFG. CO., Milwaukee, plans to resume production of small farm tractors at West Allis, Wis., main works about Dec. 1, increasing payroll from 350 to 900 men and shortly thereafter to normal force of 1200 workers. Industrial track-type tractor production at Springfield, Ill., plant now on 30-hr. week schedule, is to be stepped up substantially by Nov. 1, because of improved demand due largely to Federal aid for public construction and highway projects. H. C. Merritt is vice-president in charge of all tractor production, with headquarters in Milwaukee.

Roberts Brass Co., 229 East Lincoln Avenue, Milwaukee, manufacturer of brass castings and distributor of products of the American Brass Co., subsidiary of the Anaconda Copper Co., has changed its name to Lincoln Brass Co. The Roberts business was recently acquired by the American Brass Co.

THIS WEEK IN WASHINGTON

... Monopoly Committee's formal opening of inquiry into nation's vast economic system scheduled for Nov. 14
... Army and Navy experts study methods of speeding up, streamlining national defense machinery, may expand educational orders program.

By L. W. MOFFETT

Resident Washington Editor
The Iron Age

WASHINGTON.—Beating of the drums by the Temporary National Economic (monopoly) Committee will begin Nov. 14. This date for formal opening of the ballyhooed big buzz into the country's economic system was announced by Senator Joseph C. O'Mahoney, following a meeting of the full committee last Thursday. But to many the most significant statement made by O'Mahoney related to the future of the committee. Emphasizing the importance of adopting a general formula "for the solution of our (economic) problem," O'Mahoney said that a thorough, detailed study would take years to accomplish. The Senator then pointed out that "To a Bureau of Industrial Economics might be given the continuance of such a study as we are beginning. It's called a Temporary Committee, isn't it?"

Read into the observation by some was a meaning that the committee, or at least some of its prominent members, has cooled off greatly in its ardor to enter upon the vast task it has set for itself of inquiring into the entire economic system of the country. It is a question whether or not the committee in its preliminary work has not already discovered that the ramifications are so intricate and multifold that it could hardly begin to complete the "mosaic" in the two years time allotted to the committee by the resolution under which it was set up. There are also reports that there is growing

concern that the very vastness of the material the committee has set out to gather will waterlog it and make the job impossibly cumbersome.

Industry Is Cooperating

There also appears to be a feeling that accomplishments of the committee will fall far below those predicted by press and radio publicity given it by its more zealous adherents. It is said that even in the New Deal forecasts are being made that but little legislative action will follow the hearings, though obviously this is a question that can be determined in the future.

Certain it is that the committee will be unable to fasten responsibility for failure to do a constructive job on industry, judging by the cooperative spirit industry is said to be showing. It probably is true that much of industry, in the face of vehement denials, is afraid of a witch hunt, but the fact remains, according to committee members, that industry, as well as finance, is showing a willing spirit to cooperate.

The reference made by Senator O'Mahoney to the setting up of a Bureau of Industrial Economics was looked upon by some as meaning that he at least, and possibly other members of the committee, want to pass the buck for the study of the "economic system" from the committee to the bureau. To this end, some think, the committee may hold a few hearings, make a report at the next session of Congress and push through a bill setting up the bureau and have it take over the job of regimenting the country's economic system, piling additional bureaucracy on the already tremendous topheavy, if not toppling, bu-

reaucracy which has developed a maze, confusion and expense in Government that hitherto was never approached.

Suggested by Richberg

The idea of a Bureau of Industrial Economics originated with Donald Richberg, former NRA general counsel. He proposed that it be established in the Department of Commerce. Other Departments, hungry for more authority, are expected to angle for the bureau if it is set up. The Department of Commerce not being popular with the New Deal administration it is quite conceivable that the bureau, if established, would not go to that department, despite the fact it would be the appropriate one to administer such an agency.

To an executive committee was left the matter of preparing a written report upon procedure on the conduct of hearings and to report to the full committee the particular subjects to be covered. To the executive committee were added the names of Chairman William Douglas of the Securities and Exchange Commission and Chairman Garland S. Ferguson of the Federal Trade Commission. Other members of the committee are Senator O'Mahoney, or the vice-chairman; Representative Hatton Summers; Richard Patterson, Jr., Assistant Secretary of Commerce; and Isador Lubin, head of the Bureau of Labor Statistics.

Senator King of Utah, conservative Democrat, a member of the committee who shares no enthusiasm for the committee's program, said it suggested that it might be advisable to accept reports instead of having hearings. Committee Secretary Leon Henderson said that some information does not lend itself to hearings and that consequently much information will come through reports.

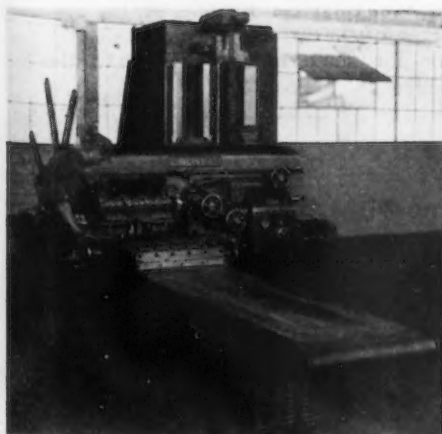
Navy to Take Bids Nov. 3 On Submarine Tender Steel

WASHINGTON.—The Bureau of Supplies and Accounts, Navy Department, will receive bids on Nov. 4 for 673 tons of steel angles and shapes for use in constructing the submarine tender *Fulton* at the Mare Island, Cal., Navy yard.

**PLENTY OF UMPH
FOR WIDE CUTS**
at savings of 20%
AND BETTER



A SYMBOL OF A DEFINITE STANDARD
OF WORTH



The CINCINNATI Horizontal Hydro-Tel Milling Machine. Also built in vertical style.

WIDE cuts like this—a gang of eight cutters all cutting at once—require plenty of smooth power to pull through the cut and plenty of mass to prevent vibrations. The CINCINNATI Hydro-Tel Millers have these requirements, plus many exclusive features which place these machines in a class by themselves. Front and rear *fingertip* control of the massive table and spindle carrier. Accurate positioning of these two slides for setting up adjustments. Automatic and filtered lubrication. Little wonder that users everywhere are so enthused about these machines, and so gratified with the savings they are obtaining. Write for complete details. The Cincinnati Milling Machine Co., Cincinnati, Ohio.

THE CINCINNATI MILLING MACHINE CO.
Cincinnati, Ohio, U. S. A.

Army, Navy Study Streamlining Of National Defense Machinery

WASHINGTON. — Army and Navy experts are studying methods of speeding up and streamlining national defense machinery and will report to Congress in January, presumably with a message by President Roosevelt recommending Congressional action.

President Roosevelt said at a press conference last week that a restudy of the whole national defense problem is necessary because of new developments along technical lines. He did not elaborate except to say that putting the manufacture of munitions and war machines on a mass production basis

will be one of the objectives of the program and he said he saw no reason why, for example, airplanes could not be made by adopting standardization methods employed by other countries.

Program Under Way

It was indicated that two divisions of the program are already under way. One is the survey being undertaken by a six-man committee headed by Assistant Secretary of War Johnson, which is studying methods for assuring ample power facilities to meet the needs of industry in the event of war. The other is the \$10,000,000 educational orders program which provides for expenditures of \$2,000,000 a year for the next five years as a method for familiarizing industrial firms with the country's wartime requirements. Conceivably, the program outlined briefly by Mr. Roosevelt may mean considerable expansion of the educational orders program.

The President indicated also that further national defense moves have been forced to a head during the past month but that the developments were technical rather than political and have been gradually forming during the past three or four years. He said that only part of the information which prompted the move is publicly known, adding that the study, which he characterized as designed to meet new world conditions, will be ready Jan. 3—the date Congress starts its 76th session. The President said he preferred to obtain a complete picture of the situation before making the plans public.

Mr. Roosevelt, discussing the subject at a press conference after he declined to make a scheduled announcement on his budget plans, pointed out that new developments require such a complete restudy of national defense measures that he plans to defer for some time reference to the budget.



THE BEST FLOORING

The best flooring in any plant has these two qualities: safety and endurance. Inland 4-Way Floor Plate excels in both.

With equally safe traction in all directions, it helps to speed all plant operations that involve floor movements. Reduction of the slipping and falling hazard prevents accidents and reduces liability.

... And when you consider low maintenance costs, remember that no other material provides the same strength, toughness and resistance to heavy traffic wear as rolled steel. Write for the 4-Way Floor Plate Book.

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INLAND 4-WAY FLOOR PLATE

Made by The Inland Steel Co., 38 So. Dearborn St., Chicago
SHEETS STRIP TIN PLATE BARS RAILS TRACK ACCESSORIES
PLATES FLOOR PLATES STRUCTURALS PILING REINFORCING BARS

Germans Exempt Sudeten Imports From Duties

WASHINGTON. — Goods from those Sudeten territories now occupied by German troops have been exempted from import duties when entering German customs territory (not including Austria) and German goods exported to the Sudeten areas have been exempted from export duties, by a decree effective immediately, according to a cablegram of Oct. 8 received in the Department of Commerce from the office of the American Commercial Attache, Berlin.

Wage-Hour Officials Sidestep Court Test

WASHINGTON. — The Labor Department's new wage-hour division was seen this week forestalling an early court test of the law's constitutionality by limiting its interpretations to those provisions in the law which specifically empower the Administrator to define their terms.

While Administrator Andrews has been credited with approaching his job in a creditable manner, there are a few complaints developing that his reluctance to lay down definite standards will lead to a great deal of confusion. The argument is heard that frequent statements that he hopes for a large amount of voluntary acceptance of the law's provisions, irrespective of whether the law applies, is far from being conducive to orderly procedure. Meanwhile hundreds of letters seeking clarification of the wage-hour law's provisions remain unanswered.

Government Buying Of Steel Increases

WASHINGTON. — The Labor Department's Division of Public Contracts reports that Government contracts for the period Sept. 30 to Oct. 8 totaled \$863,910.72 for iron and steel products and \$666,624 for machinery. The awards by the division, which will be made public on Wednesdays instead of Saturdays as heretofore, follow:

The Midvale Co., Washington, steel forgings	\$61,061.00
Crucible Steel Co. of America, Harrison, N. J., steel forgings	32,760.00
Erie Forge Co., Erie, Pa., steel forgings	70,540.50
The Midvale Co., Phila., steel forgings	43,168.13
Truscon Steel Co., Youngstown, hangar doors and fixed panels	198,928.00
Laclede Steel Co., St. Louis, steel pipe	10,177.70
U. S. Pipe & Foundry Co., Burlington, N. J., cast iron pipe and fittings	79,304.57
Bethlehem Steel Co., Los Angeles and Vernon, Cal., reinforcing steel	10,863.97
W. S. Wetenhall Co., San Francisco, reinforcing steel	10,665.00
Judson Steel Corp., Oakland, Cal., Bethlehem Steel Co., San Francisco, American Bridge Co., Pittsburgh, steel towers	82,961.68
The Patent Scaffolding Co., Inc., Philadelphia, staging bents	51,744.00
American Bridge Co., Denver, Gary, Ind., structural steel	10,921.00
American Bridge Co., Boston and Elmira, N. Y., structural steel	12,633.00
Belmont Iron Works, Philadelphia, structural steel	47,917.00
The Phoenix Iron Works, Phoenixville, Pa., Bethlehem Steel Co., Bethlehem, Pa., U. S. Steel Corp., Pittsburgh,	

American Bridge Co., Cincinnati and Ambridge, Pa., structural steel	44,635.00
Bethlehem Steel Co., Bethlehem, Pa., structural steel	54,300.00
Shepard Supply Corp., New York, shovels	22,192.60
Walter Kidde & Co., Inc., New York, steel cylinders	19,137.27
Torrington Mfg. Co., Torrington, Conn., slab milling machinery	41,697.00
G. A. Gray Co., Cincinnati, planer	22,481.00
American Tool Works Co., Cincinnati, lathe	55,000.00
Gisholt Machine Co., Madison, Wis., turret lathe	14,849.80
Cincinnati Milling Machine and Cincinnati Grinders, Inc., Cincinnati, milling machine	10,457.15

Smalley General Co., Bay City, Mich., thread milling machinery ..	12,160.15
DeLaval Steam Turbine Co., Trenton, N. J., pumps	276,990.00
Warren Steam Pump Co., Inc., New York City and Warren, Mass., pumps	61,798.00
York Ice Machinery Corp., Phila. and York, Pa., and Canton, Ohio, refrigerating plant and parts	10,505.00
Carrier Corp., Syracuse, N. Y., refrigerating equipment	37,284.76
Smith Engineering Works, Milwaukee, Wis., rock crushing plant ..	16,200.00
Industrial Brownhoist Corp., Bay City, Mich., crane	72,964.00
Michigan Power Shovel Co., Washington, cranes	34,238.00



A few hundred years ago, a blunderbuss was a well-thought-of weapon. You poured in a few handfuls of powder and any pieces of old lead you happened to have around the house. Then you closed your eyes and pulled the trigger—and hoped you'd hit something.

Today the blunderbuss is out. In every field, accuracy has replaced happenstance. And nowhere is this truer than in the exacting field of modern metal cleaning operations.

Wyandotte Metal Cleaners offer to industry specialized efficiency in keeping with the times. They're not blunderbuss cleaners. Every one of them is developed to do a particular job quickly and well—and to save every fraction of a cent possible on the operation.

If you're not using Wyandotte Metal Cleaners, it will be to your advantage to find out about them. We will be glad to send an expert Wyandotte Service Representative to call.





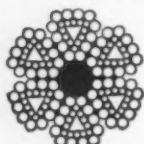
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Reduce your tool and die costs with
**HY-TEN "M" TEMPER, .70 CARBON
CR-NI-MOLY** oil hardening alloy steel.
Extreme toughness at high degrees of
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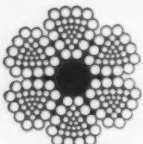
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WHEELOCK, LOVEJOY & CO., INC.

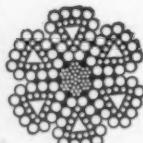
CAMBRIDGE CLEVELAND CHICAGO NEWARK DETROIT BUFFALO



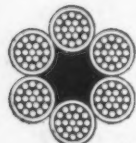
Style B
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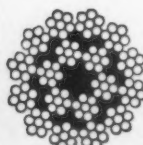
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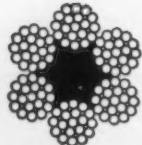
Wire Rope Center



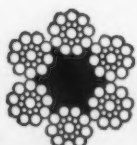
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18x7
Non-Rotating



8x19
Filler Wire



8x19
Seale



6x37
Extra Flexible



8x19
Extra Flexible

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"HERCULES"* (Red-Strand) Wire Rope..

There is no guesswork when you use "HERCULES" (Red-Strand) Wire Rope. It is designed and built to do specific jobs better . . . safer . . . more economically. Furnished in a wide variety of constructions so as to be suitable for all purposes—each backed by 81 years of manufacturing experience and close co-operation with users.

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Japan Sets Maximum Prices for Scrap

WASHINGTON.—The Japanese Ministry of Commerce and Industry has announced maximum prices for scrap iron and steel, according to a report received by the Department of Commerce from the American Commercial Attache in Tokyo. Final sales price for "old or waste steel for melting purposes in open hearth furnaces" was set at approximately \$28 per metric case and for scrap steel to be smelted in electric furnaces, at approximately \$30.80. The price for scrap steel for use in "rolled iron manufacturing" was scheduled at approximately \$36.40 per metric ton, while the maximum sales price for "old or waste pig, including cast pig" was set at \$28 per metric ton, the report stated.

All prices were fixed f.o.b. at river-side or at railway stations in the closest proximity of factories, or purchasing depots of the buyers. In instances where transportation is other than by boat or railway, the prices were set for deliveries at consumers' plants, according to the report.

Age Obstacle to Idle Machinists, WPA Holds

WASHINGTON.—Results of a WPA white-collar project conducted in Philadelphia shows, according to one of WPA Administrator Hopkins' aides, that while age is no handicap to a skilled machinist in retaining a job, once he becomes unemployed age becomes a distinct liability in attempting to find another job. The report, one of a series to be made on reemployment opportunities and changes in industrial technique, said that contrary to reports in 1935 and 1936 that there was a labor shortage in the occupation, one out of eight machinists in Philadelphia was found to be unemployed.

SWOC Bargains for West Coast Company

WASHINGTON.—The National Labor Relations Board has announced certification of Local No. 1649 of Steel Workers Organizing Committee, an affiliate of the Committee for Industrial Organization, as the sole collective bargaining representative for production and maintenance workers of Berkeley Steel Construction Co., Berkeley, Cal.

Sheet & Tube Acquires Clayton Mark Division

YOUNGSTOWN. — Youngstown Sheet & Tube Co. announces that on Oct. 12 it acquired from Clayton Mark & Co., Chicago, that company's entire business of manufacturing butt weld pipe and of marketing butt weld and lap weld pipe, except cut lengths and rigid conduit.

At the same time Youngstown Sheet & Tube transferred to Clayton Mark & Co. the Sheet & Tube business of manufacturing forged steel unions and water well supplies, which had previously been conducted by Sheet & Tube at its Evanston, Ill., plant.

The transactions involve the sale to Clayton Mark & Co. by Youngstown Sheet & Tube Co. the latter's Evanston plant and the acquisition by Sheet & Tube of Clayton Mark's butt weld pipe facilities, which will be consolidated with Youngstown's own facilities for manufacture of butt weld and lap weld pipe.

Clayton Mark & Co. will discontinue its manufacture of butt weld pipe and its sale of butt weld and lap weld pipe and will confine its manufacture to forged steel unions and water well supplies and its selling to those products and cut length pipe and rigid conduit.

NLRB Schedules Three Auto-Lite Co. Elections

WASHINGTON. — The NLRB has scheduled three collective bargaining elections before Nov. 1 at the Toledo, Ohio, plant of the Electric Auto-Lite Co., to permit (1) office workers to vote for or against the CIO's automobile workers union; (2) pattern makers to vote for or against the Pattern Makers Association of Toledo, AFL affiliate; and (3) all other production, factory and manual office workers to vote for or against the CIO's automobile workers union. The board has recognized the Mechanics' Educational Society of America, Local No. 4, as exclusive representative for employees in six designated departments of the company's Toledo plant.

Detroit Gas Absorbs Smaller Utilities

DETROIT CITY GAS CO. has become the National Consolidated Gas Co. Sanction has been received from both State and National Securities Commissions to permit its consolidation with smaller utilities in communities near Detroit.



but also clips, clamps, bent wire shapes, small stampings, and the like are produced in large volume by this company for manufacturers all over the United States. On these items, too, Gibson keeps close check on materials and specifications. Due to special equipment available in this large, modern plant, prices are very much "in line" and deliveries rapid. Try us for such parts!

WILLIAM D. GIBSON CO.

Div. of Asso. Spring Corp. 1800 Clybourn Ave., Chicago, Ill.

Services of our engineers available for design or re-design of springs, clips, small stampings, etc. Your inquiries invited.



• Out of our stock of 30 million cap and set screws you can always get prompt shipments for these stocks are maintained in a full list of sizes at all times. Set screws with Flat, Cone, Dog, Cup, Round and Oval points are available—and all are made to usual Cleveland Cap Screw standards, a Class 3 fit. Threads are very accurate, heads true, and all of our Set Screws are case hardened by the most modern heat treating equipment existing. Ask for samples. Catalog E and price list on request. THE CLEVELAND CAP SCREW COMPANY, 2929 E. 79th Street, Cleveland, Ohio.

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SET SCREWS • BOLTS AND NUTS

Address the Factory or Our Nearest Warehouse:

CHICAGO, 726 W. Washington Blvd.
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NEW YORK, . . . 47 Murray Street
LOS ANGELES, 1015 East 16th St.

Foundrymen to Meet at Cornell on Nov. 25-26

NATIONALLY prominent speakers have been scheduled for the second Cornell regional foundry conference, to be held at Cornell University, Nov. 25 and 26, under the sponsorship of the Buffalo chapter, American Foundrymen's Association, the Syracuse Foundrymen's Association and Cornell.

Among the speakers are Dr. E. E.

Day, president, Cornell; J. A. Voss, director of industrial relations, Republic Steel Corp.; Donald J. Reese, International Nickel Co.; Pat Dwyer, engineering editor, *The Foundry*; H. W. Dietert, president, H. W. Dietert & Co., Detroit; Dr. Leonard Greenburg, director industrial hygiene, New York State Department of Labor, and others.

The subjects to be discussed include steel castings, practical sand control problems, elementary metallurgy, cu-

pola practice, dust hazards, gates and risers and malleable iron.

Society for Metals to Hear Steel Metallurgists

CHICAGO.—Steel plants in the Calumet and South Chicago district are providing the American Society for Metals with speakers for lectures to be held in Gary under the association's sponsorship. The lectures, which will be on "Steel Making and Shaping," and "Heat Treatment of Steel," will be free. Among the speakers will be M. Asimow, metallurgist, Gary works, Carnegie-Illinois Steel Corp.; V. Gregor, superintendent, fuel department, Gary works; Thad Lutz, metallurgist, Inland Steel Co.; D. Simpson, metallurgist, Gary works; A. S. Laszlo, general open-hearth foreman, Gary works; R. W. Dickson, metallurgist, Gary works; Stephen F. Urban, metallurgist, South works, Carnegie-Illinois; John E. Angle, assistant to general superintendent, Gary sheet and tin mills, Carnegie-Illinois; Karl F. Schauwecker and H. B. Wishart, metallurgists, Gary works.

Foundrymen's Conference At Purdue Oct. 27-29

CHICAGO.—A three days' regional foundrymen's conference will be held at Purdue University, Lafayette, Ind., Oct. 27 to 29, under the sponsorship of local chapters of the American Foundrymen's Association. Grey iron, steel and malleable will be discussed in sections with many phases of molding, melting and annealing being covered. General discussion sessions also will be held and on the final day demonstrations of physical testings and spectrographic analyses will be seen. Some of the speakers are John L. Lowe, Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich.; M. A. Scott, Greenlee Foundry Co., Chicago; H. A. Forsberg, Continental Roll & Steel Foundry Co., Chicago, and W. D. McMillan, International Harvester Co.

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All Welded for



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Every Industry

SAFETY — LOW MAINTENANCE
PERFORMANCE



● Cleveland Trolley Frames - Are All Welded - One Piece. Every pound of steel so placed as to be most effective. No excess weight — but greater strength, rigidity and reliability.

ALSO BUILDERS OF



THE CLEVELAND CRANE & ENGINEERING CO

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MATERIALS HANDLING EQUIPMENT

Trico Fuse Mfg. Co., Milwaukee, announces the appointment of Marine Specialty & Mill Supply Co., 201 Julia Street, New Orleans, as agent-distributors for the state of Louisiana and southern Mississippi for the complete line of Trico powder-packed renewable fuses, Kantark one-time fuses, Colortop plug fuses, Trico-matic thermal time-lag plug fuses, Tamres tamper-resisting plug fuses, special fuses, Kliplok clamps for fuse clips, test clamps, fuse pullers and lubricators.

Utility Electric Installs Induction Furnace on Coast

UTILITY ELECTRIC STEEL FOUNDRY, Los Angeles, will place in operation Nov. 1, what is said to be the first induction furnace installation on the Pacific Coast for production of high grade alloy steel castings. The company specializes in alloy steels for refinery and aircraft construction in addition to the regular commercial analyses of heat and corrosion resistant materials.

An addition to the main foundry building has added 6000 sq. ft. of floor space. Special foundry equipment has been installed to supplement the new furnace, which will make the alloy department an independently contained unit. The total expenditure for the complete program will exceed \$50,000.

Utility Electric Steel Foundry is a wholly owned subsidiary of Utility Trailer Mfg. Co., manufacturer of heavy duty trailers, semi-trailers and attachments in the West. Officers and directors are: E. W. Bennett, president; G. L. Knox, vice-president; H. C. Bennett, secretary and treasurer; E. C. Hummel, manager.

Trackwork Shipments Decline 17 Per Cent

SHIPMENTS of T-rail trackwork of 60 lb. per yd. and heavier totaled 2346 tons in September, a decline of 17.3 per cent from the preceding month, according to the American Iron and Steel Institute. In August shipments were 2838 tons and in September, 1937, were 8101 tons. The accumulative total for the first nine months of the present year is 27,404, as compared with 77,891 tons in the corresponding period of 1937.

1000 Tons of Aluminum Shipped to Cleveland

CLEVELAND.—First Lake shipment of aluminum destined for Cleveland in about five years was loaded recently at Ogdensburg, N. Y., into the steamer Bennington. The shipment consisted of about 1000 tons consigned to the Aluminum Co. of America here.

Triplex Screw Adds Rivet Department

TRIPLEX SCREW CO., Cleveland, maker of cap and set screws, bolts and nuts, announces addition of a rivet department. The new division of this 20-year old concern will short-

ly be in position to manufacture round, cone, flat and countersunk head rivets. Triplex is now producing coopers' and tinners' rivets.

Republic's Cleveland Payroll Rises \$350,000

REPUBLIC STEEL CORP. payrolls in the Cleveland area increased approximately \$350,000 during the third quarter as compared with the second quarter of 1938. Pay-

rolls for the third quarter approximated \$2,750,000 and for the second quarter \$2,400,000. The payroll total is continuing upward.

The increase is due to expanded demand for steel and steel products which is originating from diversified industries.

The payroll totals for Cleveland cover the Corrigan-McKinney plant, the new strip mill, the Upson Works, the Truscon Steel Co., Steel & Tubes, Inc., and the company's general offices.



**GREATER MILEAGE
CRANE WHEELS**

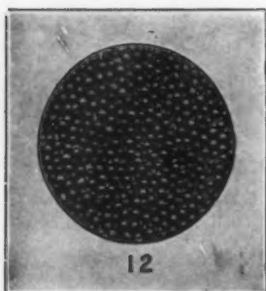
The principal advantages of Standard rolled steel crane wheels are greater strength and toughness and better adhesion to the rail with a minimum of wear on the wheel and rail.

The open hearth steel used in these wheels is produced in our own furnaces subject to close metallurgical control.

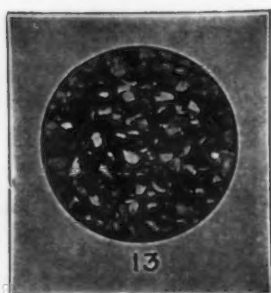
STANDARD STEEL WORKS CO.
Subsidiary of the Baldwin Locomotive Works
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PRODUCTS
Steel Castings
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Rolled Wheels
Heavy Springs
Rolled Rings
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STANDARD



SHOT



GRIT

Unusual quality is creating demands for both our Heat-Treated Chilled Shot, and Heat-Treated Steel Grit.

One contract calls for 300 tons of our steel grit; another contract calls for 250 tons of our Special Heat-Treated Shot. Many car-load lots of both shot and grit.

There must be a reason for this, and the reason is plain: namely, unusual quality; prompt deliveries; uniform quality the year round; satisfactory prices.

Send samples of the sizes you are now using. We will match any size, and name prices that will interest you.

We manufacture a shot and grit that you will eventually use.

HARRISON ABRASIVE

Corporation

MANCHESTER, NEW HAMPSHIRE

We Never Compromise With Quality

... OBITUARY ...

WESLEY G. NICHOLS, formerly president of the American Manganese Steel Co., died last week in Chicago Heights, Ill., aged 70 years. Mr. Nichols' first association with the steel business was in the Pennsylvania steel mills as a laborer at the age of 14, wheeling pig iron to the cupolas. His first executive experience was with Glasgow Iron Co., Pottstown, Pa., from where he went to the Wellman Iron & Steel Co. in Thurlow, Pa., and the Taylor-Wharton Iron & Steel Co. in High Bridge, N. J. In 1906 he moved to Chicago in charge of the manganese operations of the American Brake Shoe & Foundry Co., the predecessor to the Edgar Allen American Manganese Steel Co., which later became the American Manganese Steel Co. His first title was superintendent, advancing later to vice-president and then to the presidency, which position he held for 15 years, retiring in 1933. Mr. Nichols was active in political and civic affairs in the South Chicago-Calumet District, and was a member of many clubs in the Chicago area.

♦ ♦ ♦

RAYMOND MOTT CALKINS, president, Steelex Co., a construction concern specializing in steel houses and buildings, died recently in Deerfield, Ill., aged 52 years. Mr. Calkins was a son of Ransom M. Calkins, former president, Milwaukee railroad, who died in 1932. Mr. Calkins from 1916 to 1919 was American representative of the Commonwealth Government of Australia and its shipping line, and was engaged in shipbuilding in Seattle. Until 1928 he was president of the Northwest Gypsum Products Co., Lewistown, Mont., after which he was associated with various investment houses in Chicago, assuming the Steelex presidency in 1933.

♦ ♦ ♦

OSCAR F. KIRSTEN, co-founder with the late Charles H. Doelger of Doelger & Kirsten, Inc., Milwaukee, manufacturer of Alligator shears and other metalworking machinery, died on Oct. 11, aged 82 years. The firm was founded in 1891. Mr. Kirsten, a native of Germany and a resident of Milwaukee for 51 years, became president of the firm upon the death of Mr. Doelger in 1931. Two sons, Oscar W. and Dr. William C. Kirsten, are vice-president and secretary-treasurer respectively.

♦ ♦ ♦

ELIAS JENKINS, former secretary Western Sheet and Tin Plate Manu-

facturers' Association, died Sept. 29 at his home in Youngstown, Ohio, at the age of 80. Mr. Jenkins was born in South Wales. After coming to this country he worked in a number of mills in the Youngstown district. In 1928 he became secretary of the Association, negotiating wage contracts.

♦ ♦ ♦

CARL C. HARRIS, Cleveland steel broker and formerly associated with Otis Steel Co., and the Illinois Steel Co., died Oct. 2 in Cleveland, after a long illness.

♦ ♦ ♦

R. ROY SHUMAN, account executive at Evans Associates, Inc., Chicago, at the time of his retirement in 1936, and Western editor, THE IRON AGE, from 1902 to 1905, died after a long illness last week in Tampa, Fla., aged 71 years. Mr. Shuman, a well-known figure in industrial advertising circles, graduated from Northwestern University in 1891 and soon became a reporter on the Chicago Tribune. Shortly thereafter he served as advertising manager of the Deering-Harvester Co., Chicago, and from 1898 to 1900 was advertising manager of Carson-Pirie-Scott & Co., Chicago. Advertising manager of Joseph T. Ryerson & Son, Inc., from 1900 to 1902, he edited at the same time this company's house organ, "Boiler Maker and Sheet Metal Worker." For the next three years he was Western editor of THE IRON AGE, leaving in 1905 to become Western advertising manager of the Liquid Carbonic Corp. In 1913 he formed his own agency, Shuman-Booth, which he operated until 1929, when he joined Evans Associates as an account executive. A brother, Jesse, is associated with Jones & Laughlin Steel Corp., Pittsburgh. Mr. Shuman was an honorary member of the Executives' Club of Chicago.

♦ ♦ ♦

FRANK ZAGELMEYER, 77-year-old manufacturer of Bay City, Mich., died Oct. 12. He was president of Bay City Cast Stone Block Co., the Zagelmeyer Cast Stone Block Machinery Co. and the Zagelmeyer Auto Camp Co., a manufacturing concern. He was born in Saginaw and had been in business in the Saginaw Valley region for more than 50 years.

♦ ♦ ♦

DANIEL T. TIMBERLAKE, 84 years old, inventor of the four-wheel brake for automobiles, died Oct. 11 at Downey, Calif.

♦ ♦ ♦

JOHN W. EMERICK, manufacturers' agent, died Oct. 8 at his home in De-

troit after a short illness. He was born 48 years ago in New Lathrop, Mich., and had lived in Detroit 35 years.

♦ ♦ ♦

AUSTIN BURT was buried in Detroit, Oct. 15. He died at his home in Ontario, Cal., on Sept. 25. Mr. Burt, 68 years old, was born in Detroit and was graduated from Cornell University as an electrical and mechanical engineer. He was past-president of the American Institute of Electrical Engineers and of the American Society of Mechanical Engineers.

♦ ♦ ♦

JAMES A. GEORGE, for many years head of the hot mill division of American Sheet & Tin Plate Co. at New Castle, Pa., died Oct. 10 in Sharon after a month's illness. He was 74 years old.

♦ ♦ ♦

A. WERNER CARLSON, treasurer of the Gardner Metal Products Co., Gardner, Mass., was buried Oct. 13. Mr. Carlson was a native of Finland, and was associated with Gardner industries, of which his brother is president, for the past 35 years.

PWA Awards \$18,000,000 For New Chicago Subway

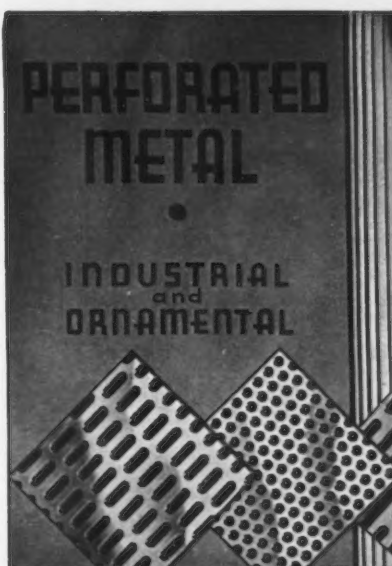
WASHINGTON.—The PWA has approved an \$18,000,000 grant to the city of Chicago for construction of a proposed \$40,000,000 subway. The balance of the funds will be supplied by the city. Two plans had been advanced but the PWA approved the more extensive of the two. Under the terms of all PWA authorizations, construction must start by January, 1939, and be completed within two years.

Cincinnati Chosen for A.F.A. Convention in '39

THE 1939 annual convention of the American Foundrymen's Association will be held at Cincinnati from May 15 to May 18, the association has announced.

The 1939 convention will be held without an exhibit and patterned after the successful technical meetings held in Chicago in 1927 and in Toronto in 1935. The entire program will be devoted to technical, management and general interest sessions, shop operation courses, round table discussions and committee meetings, plant visitation and social functions.

The Harrington & King PERFORATING CO.



H & K industrial perforations embrace a range of sizes and shapes intended to meet the most exacting requirements of all industries.

H & K ornamental designs include standard and many beautiful and exclusive patterns suitable for architectural grilles, enclosures, ventilators, and all decorative uses.

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The chromium in *KONIK forms carbides which increase the speed and amount of carbon absorption... you can get a deeper case, or a specified case in less time or with lower temperature. Hardening, too, is deeper, more uniform, more dependable. For a better product at lower cost use this modern metal with patented ratios of copper, nickel, and chromium.

CONTINENTAL STEEL CORP.

General Offices: Kokomo, Indiana
Plants at Canton, Kokomo, Indianapolis

... THE NEWS IN BRIEF ...

Secretary of Interior Ickes declares that the PWA program will take 6,500,000 tons of steel in message to American Institute of Steel Construction; convention hears forecasts that elevated highway is vast future outlet for structural steel.—Page 36.

Rustless Iron & Steel Corp. reports dollar value of September shipments was 66 per cent above monthly average for first eight months of year.—Page 37.

Czechoslovak iron and steel industry hampered by split up.—Page 37.

Automobile production tops 50,000 for first time since May. . . . General Motors recalls workers. . . . Meeting of Ford and Martin raises conjectures.—Page 40.

Charles R. Hook, president, National Association of Manufacturers, issues call for the 1938 meeting of the Congress of American Industry for Dec. 5-9, at New York.—Page 43.

Allis-Chalmers Mfg. Co. plans to resume production of small tractors at West Allis, Wis., about Dec. 1, recalling 850 workers.—Page 43.

Philip Murray warns steel industry to "put its house in order," threatens SWOC-sponsored legislation to prevent price-cutting, claims rebates in commissions, compares steel to soft coal industry's confusion prior to the Guffey Act.—Page 43.

Three Wisconsin plants of the Nash Motor Co. resume operations following settlement of labor dispute.—Page 43.

More automobile prices are cut.—Page 43.

Formal opening of the Monopoly Committee's inquiry into the nation's complex economic system is scheduled to begin Nov. 14; completing task in allotted two years seen as impossibility.—Page 44.

Navy will receive bids Nov. 4 on steel for submarine tender.—Page 44.

Army and Navy experts study methods of streamlining national defense machinery, may seek expansion of educational orders program.—Page 46.

Germany exempts goods entering Reich from occupied Sudeten territories from import duties.—Page 46.

Labor Department's wage-hour division sidesteps court test of the wage-hour law's constitutionality.—Page 47.

Government buying of steel increases.—Page 47.

SWOC union becomes sole bargaining agent for employees of Berkeley Steel Construction Co.—Page 48.

Japan announces maximum prices for scrap iron and steel.—Page 48.

Age is a handicap to unemployed machinists, the WPA finds in study at Philadelphia.—Page 48.

Detroit City Gas Co. consolidates with smaller utilities near Detroit, becomes National Consolidated Gas Co.—Page 49.

Youngstown Sheet & Tube Co. acquires butt weld pipe division of Clayton Mark & Co., Chicago.—Page 49.

Electric Auto-Lite Corp. employees will vote in three NLRB elections.—Page 49.

Foundrymen schedule nationally prominent speakers for second regional conference at Cornell University, Ithaca, N. Y., Nov. 25-26.—Page 50.

Three-day regional foundrymen's conference scheduled for Oct. 27-29 at

Purdue University under sponsorship of American Foundrymen's Association's local chapters.—Page 50.

American Society of Metals schedules Chicago district metallurgists to speak in series of lectures on steel making, shaping and heat treating at Gary.—Page 50.

Utility Electric Steel Foundry places into operation at Los Angeles an induction furnace installation for production of high grade alloy steel castings.—Page 51.

Republic Steel Corp. payrolls in the Cleveland area increases \$350,000,000 during the third quarter of 1938.—Page 51.

First Lake shipment of aluminum to Cleveland in five years is loaded at Ogdensburg, N. Y.—Page 51.

Triplex Screw Co., Cleveland, announces addition of rivet department.—Page 51.

Shipments of rail trackwork of 60 lb. per yd. or heavier declined 17.3 per cent in September.—Page 51.

American Foundrymen's Association will hold its 1939 annual convention May 15-18 at Cincinnati.—Page 53.

PWA grants \$18,000,000 to city of Chicago for construction of proposed \$40,000,000 subway.—Page 53.

Charles D. Wiman, Deere & Co. official, sees farm equipment business tapering in first half of 1939.—Page 60.

Illinois supreme court upholds jail sentences and fines for 39 men who refused to leave Fansteel Metallurgical Corp.'s plant during a strike called by the CIO.—Page 61.

President's Emergency Railroad Board completes investigation of proposed 15 per cent rail wage reduction; outcome in doubt. . . . Three Wisconsin foundries combine sales forces.—Page 61.

American Society of Tool Engineers sets attendance record for its semi-annual meetings; is told Government pressure is to blame for "suicidal" sheet steel price reductions.—Page 62.

Machine tool makers see vast business increase if general war develops in Europe but fear ultimate consequences, Howard W. Dunbar, vice-president, Norton Co., tells National Machine Tool Builders' Association convention at Hot Springs, Va.—Page 82.

Machine tool orders in September declined slightly from August, the National Machine Tool Builders' Association reports.—Page 82.

SECTIONS INDEX

Personals	56
Obituary	52
Steel Ingot Production	65
Summary of the Week	66
Comparison of Prices	67
Pittsburgh, Chicago, Cleveland, Philadelphia and New York Market	68
Non-ferrous Market	72
Scrap Market and Prices	74-75
Finished Iron & Steel	76-77
Pig Iron & Raw Material Prices	78
Warehouse Prices	79
Machine Tool Activity	82
Fabricated Steel	73
Plant Expansion & Equipment	80

MEETINGS

- Oct. 21—Foundry Equipment Manufacturers Association, Cleveland.
- Oct. 21 to 22—Industrial Unit Heat Association, French Lick, Ind.
- Nov. 14—Society of Automotive Engineers, annual dinner, New York.
- Nov. 16 to 17—Purchasing Agents' Association, Chicago.
- Nov. 16 to 17—Porcelain Enamel Institute, Cleveland.

TO FIT YOUR NEED

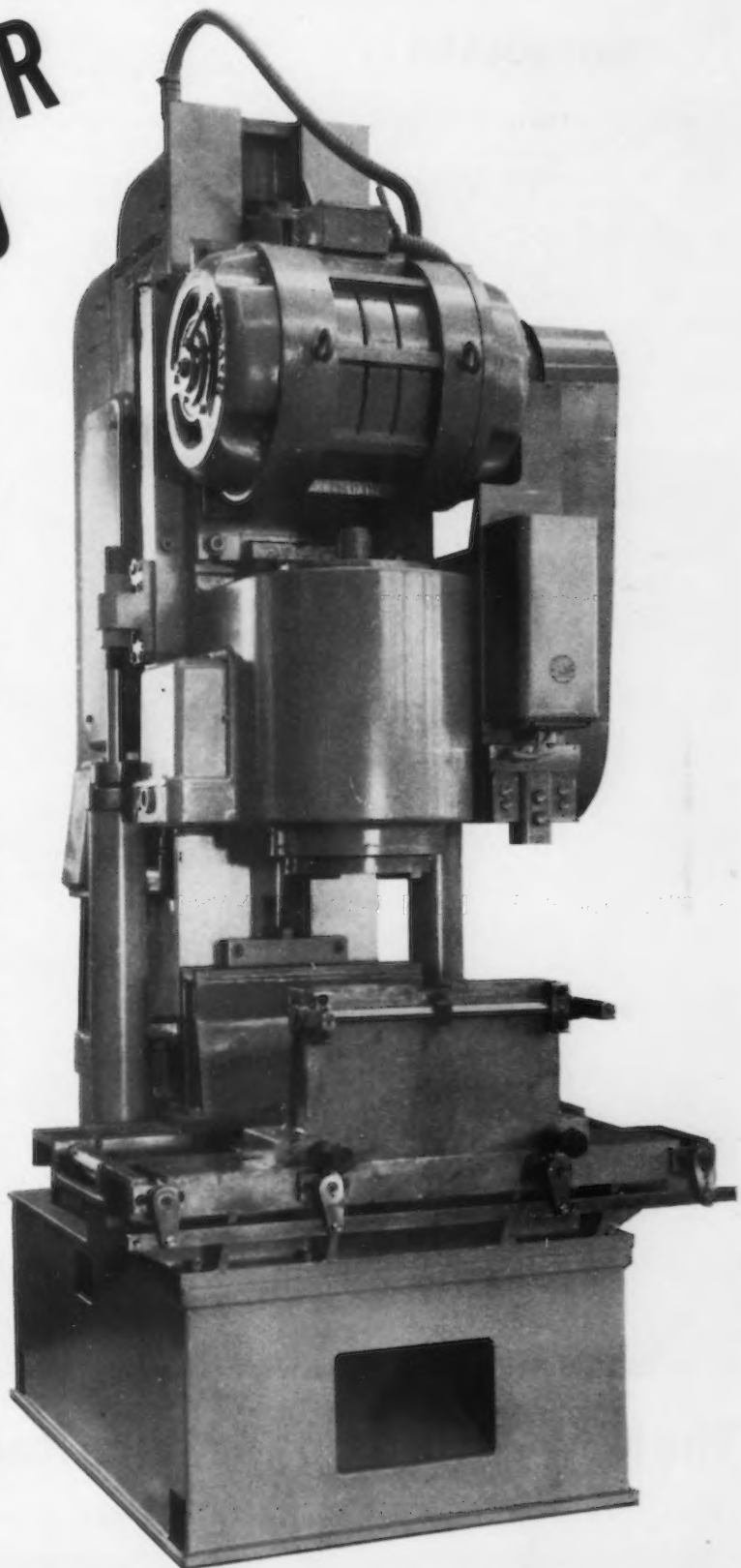
A machine specially designed for your particular class of work means the most efficient operation. You need not waste excess capacity and power, nor need you strain inadequate equipment with resulting inaccuracy.

There are Baker standard machines to meet the requirements of light, medium, heavy or extra heavy duty in drilling, boring, tapping or reaming operations. Each is a separate machine individually engineered and of balanced construction throughout for the type of work intended. The machine illustrated is for extra heavy boring.

These standard machines are the basis of Baker high production equipment. Variations to fit the special jobs may include multiple spindles, special fixtures and special heads.

Our engineering department will specify the proper standard equipment or develop special equipment for production work. Submit your problem to Baker Brothers, Inc., Toledo, Ohio—New Jersey office, 1060 Broad Street, Newark.

No. 60-HO Vertical hydraulic feed machine arranged with a heavy duty lower drive single spindle head bracket. Spindle driven through means of worm and worm gear, with provision for pick-off gears for change of spindle speed. Machine shown was tooled up for heavy boring operations on crankcase main frame members for large Diesel Engines.



★ BAKER ★

... PERSONALS ...

WILLIAM J. DAVIDSON, whose nomination for the presidency of the Society of Automotive Engineers was announced last week in *THE IRON AGE*, is with the Winton Engine Corp., a diesel division of the General Motors Corp. Born in Montreal, Canada, in 1891, he received his formal education at Westmont Academy, Montreal and McGill University, graduating with a degree of Bachelor of Science in me-

chanical engineering. He joined the engineering department of Cadillac Motor Car Co. in 1914 in Detroit, and served in France in the Motor Transport Corps, having been discharged with the rank of captain in 1919. Mr. Davidson, in 1934, was awarded the Cross of the Legion of Honor by France in recognition of his war service and friendly cooperation with French engineers since the war. Returning from war, he was made chief engineer of the Canadian Products division of General Motors Corp.,



The New 2½' Super-Service Radial

Offers advantages of size, economy, ease of handling, power and floor space savings, and the adaptability of pick-off gears. Designed especially for production drilling, tapping and reaming of holes up to ¾" diam. in steel or 1" in cast iron, every feature to promote fast, easy handling, long life and safety is incorporated. Write for Bulletin R-26 giving complete information.

THE CINCINNATI BICKFORD TOOL CO.
OAKLEY CINCINNATI OHIO U.S.A.



W. J. DAVIDSON

Walkerville, Ont. Later he went to Oshawa as technical director of General Motors of Canada, Ltd. In 1923 he was promoted to the staff of Alfred P. Sloan, Jr., then president of General Motors, and in 1926 he was made executive secretary of the newly formed new devices committee. In 1930 he became business director of General Motors Research Laboratories and served as technical director under R. H. GRANT, vice-president in charge of sales, until his appointment as general sales manager of the Winton Division last year.

♦ ♦ ♦

JOHN R. JOHNSTON, since 1935 manager of sales, Milwaukee district, Carnegie-Illinois Steel Corp., Pittsburgh, has been appointed assistant manager of sales of the Chicago district sales office. In entering his new duties, Mr. Johnston returns as a sales executive to the district where he began as a sales training student in 1925 after his graduation from the University of Illinois. Upon completion of the training course at the Gary steel works, he was transferred to the rail bureau at Chicago. He was later made assistant chief clerk and chief clerk of the bar bureau. In 1929 he became a salesman in the Chicago district sales office and served in that capacity until 1935, when he was made manager of sales at Milwaukee.

♦ ♦ ♦

B. F. AFFLECK, former president of Universal Atlas Cement Co., has been elected an honorary member of the Western Society of Engineers. The society has only eight honorary mem-



J. R. JOHNSTON

bers, including Herbert Hoover and Dr. Arthur Compton.

Mr. Affleck, who was born at Belleville, Ill., in 1869, is a member of the Portland Cement Association, of which he was president 1916 to 1920; a member of the American Iron and Steel Institute, a member of American Society for Testing Materials, and a member of the New York and Chicago Engineers' Clubs. He has been active in civic and industrial affairs and is a member of the Chamber of Commerce of the United States, the Chicago Association of Commerce and the Illinois Manufacturers Association.

♦ ♦ ♦

A. M. MACCUTCHEON, engineering vice-president, Reliance Electric & Engineering Co., Cleveland, sailed from New York Oct. 15 for a nine-week business trip abroad. In Europe he will study recent developments in design and manufacturing.

♦ ♦ ♦

CHARLES E. MCINTYRE has been appointed assistant manager of sales at the Cleveland district sales office of Carnegie-Illinois Steel Corp., effective Oct. 15. Mr. McIntyre has spent his entire business career in the Cleveland office, beginning as office boy in 1917. After training in clerical positions, he became a salesman in 1924, and for two years preceding his present appointment was assistant to the manager of sales.

♦ ♦ ♦

JAMES M. WOLTZ, for many years safety director and lately supervisor of plant police for Youngstown Sheet

& Tube Co., Youngstown, has retired from active service after rounding out 25 years with the company. Mr. Woltz was one of the organizers of the National Safety Council and is widely known for his work on safety and compulsory compensation.

♦ ♦ ♦

LOUIS J. LARSON, consulting welding engineer, Milwaukee, and for an extended period engineer in charge of welding research for the A. O. Smith Corp., will present an illustrated lec-

ture on modern developments in welding at a meeting of the Milwaukee section, American Society of Mechanical Engineers, on Oct. 27.

♦ ♦ ♦

GEORGE R. GREGG has been appointed Pittsburgh representative, with offices in the Clark Building, of the Michigan Products Corp., Michigan City, Ind.

♦ ♦ ♦

YALE D. HILLS, for several years manager of the Los Angeles district

Inland Created Ledloy to Save Machining Costs —and Here Are Some Typical Results

An Automotive Parts Maker

"Using Inland Cold Finished Ledloy, we were able to reduce our machining time on automatic parts from 11 seconds to 3½ seconds. The machine finish obtained with Inland Ledloy is excellent."

Household Utilities Manufacturer

"We are now using Inland Cold Finished Ledloy for a part formerly made of SAE X-1315. It has increased our rate of production 45%. Results from heat-treatment are also completely satisfactory."

Conveyor Equipment Manufacturer

"We are using Inland Cold Finished Ledloy 1115 on a screw machine job that is threaded the entire length of the bar. Formerly we used SAE X1112 for this part. Inland Ledloy is saving us \$12.50 per ton in direct labor cost alone. We could not afford to pass up this attractive economy."

Ledloy has the same characteristics as any other open hearth steel except for its greatly increased machinability. Order cold finished Ledloy from leading cold drawing concerns and hot rolled forms from Inland.

INLAND STEEL CO.

38 South Dearborn Street, Chicago

*Sheets Strip Tin Plate Bars Plates Reinforcing Bars
Floor Plates Structural Piling Rails Track Accessories*



V. A. JEVON

branch of Timken Roller Bearing Co., Canton, Ohio, has been made manager of distributor sales for the service-sales division of the company, with headquarters at Canton.



V. A. JEVON has been appointed assistant to the vice-president in charge of sales of the Jones & Laughlin Steel Corp., Pittsburgh. He has been district sales manager at Baltimore since April 1, this year, and is succeeded in that city by Henry R. Dorney, who has been assistant district sales manager.



W. MILLER

William K. Breeze, who has been assistant district sales manager in the New York office, has been appointed district sales manager. Charles M. Mason, who held an assistant sales managership in Buffalo, has been made district sales manager at that city. Park B. Turner, recently a member of the firm of Turner, Gill & Crouter,



WILLIAM K. BREEZE



CHARLES M. MASON

Philadelphia, has been appointed special representative of the Eastern offices, which include Atlanta, Baltimore, Boston, New York and Philadelphia.

Samuel A. Fuller, for a number of years district sales manager at Boston, has been made district sales manager



H. R. DORNEY

at Chicago, succeeding Maxon A. Blessing, who has become manager of the Chicago warehouse, with T. B. Daniels, of the Cincinnati office as assistant manager of the warehouse. Mr. Fuller is being succeeded at Boston by Francis B. Kittredge, who has been assistant district sales manager.

William Miller, former manager of strip-sheet sales, Pittsburgh, has been made district sales manager at Detroit, succeeding Walter J. Bothwell, who has been transferred to Pittsburgh to become manager of the newly-created Bureau of Standardiza-



R. J. STAYMAN

tion. Charles M. Merritt and Walter S. Fischley, of the Detroit office, have become assistant district sales managers of that office.

R. J. Stayman has been made manager of warehouse sales, with headquarters in Pittsburgh. H. B. Royer, who has been manager of the warehouse at Long Island City, N. Y., has been appointed manager of warehouse operations, with headquarters in Pittsburgh.

♦ ♦ ♦

O. M. GIBSON, formerly metallurgist at Dodge Brothers Corp., recently was appointed research director of G. S. Rogers & Co., Chicago, manufacturers of processing materials used in the heat treatment and finishing of steel machines and automotive parts. All production control and research laboratories of the company's middle-West and Eastern seaboard plants will be under his supervision. Mr. Gibson, a graduate of the University of Detroit, formerly was field metallurgical engineer for J. B. Ford Co. and later was manager of the metal-working research department at E. F. Houghton & Co., Philadelphia. For the last 15 years he has specialized in cost control as applied to heat treatment and general manufacture of automobile and machinery parts.

♦ ♦ ♦

W. K. YOUNG, for several years identified with the production division of Barber Colman Co., Rockford, Ill., and later assistant general manager of the Davis Boring Tool Co., St. Louis, has joined the Eclipse Counterbore Co., Detroit, as manager of the newly-created boring bar division.

♦ ♦ ♦

D. R. BURR, consulting manager for the mechanical goods sales department of the Goodyear Tire & Rubber Co., Akron, Ohio, and for 44 years identified with the rubber industry, has retired on pension. He has been associated with the Goodyear company since 1913.

♦ ♦ ♦

EDWIN M. SHERWOOD has been appointed to an Ohio State University fellowship in metallurgy by the Battelle Memorial Institute. He is to study austenite - ferrite transformation in stainless steels and related alloys.

♦ ♦ ♦

ROY M. HENDERSON has been elected vice-president in charge of the middle section of the United States, with headquarters in Chicago, by United Engineers & Constructors, Inc., Philadelphia.

HARRY W. SMITH, JR., for five years identified with the American Gas Association, New York, in the Cleveland and Los Angeles testing laboratories, has been appointed director of industrial gas publicity of the industrial gas section of the association.

Iron Ore Consumption

Gained in September

CONSUMPTION of Lake Superior iron ore by blast furnaces during September totaled 2,313,865

gross tons, a gain of 237,046 tons over the August consumption of 2,076,819, according to the Lake Superior iron ore association. Total ore on hand at furnaces and Lake Erie docks on Oct. 1 was 37,873,559 gross tons compared with 37,050,338 on hand Sept. 1.

Seaman Body Corp., Milwaukee, principal supplier of bodies for Nash and Lafayette automobiles, has been dissolved to become a direct operating property of the Nash Motors Co., Kenosha, Wis., subsidiary of the Nash-Kelvinator Corp., Detroit.



PUSH BUTTONS

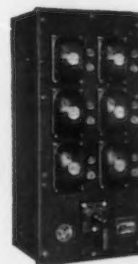
For automatic motor starters, controllers, lighting circuits, etc. Standard, vapor-proof, explosion-proof, dust-tight and water-tight.



Type EO Explosion-proof Push Button (Oil-Immersed or Air-Break) Provision for padlock to lock in "off" position is furnished as standard.



STANDARD TYPE J
PUSH BUTTON



Splash - proof Push
Button Control Station
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tool.



VAPOR-PROOF
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HEAVY DUTY MOTOR CONTROL
FOR CRANES, MILL DRIVES AND
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Gentlemen:

Please send me your Bulletin 1105-A on
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CAST IRON PIPE.

Upton, Mass., has been granted a PWA loan for a water system to cost \$180,000. X. Henry Goodnough, Inc., 14 Beacon Street, Boston, is engineer.

Ashland, Me., has tentative plans for a water and sewerage system to cost \$90,000. W. H. Owen, 221 Center Street, Brewer, Me., is engineer.

Northampton, Mass., has under consideration pipe lines, pump house and standpipe to cost \$125,000, for which PWA has granted \$56,250. X. Henry Goodnough, Inc., Boston, is engineer.

Cherryfield, Me., will ask bids soon on waterworks construction to cost \$55,000. W. H. Owen, 221 Center Street, Brewer, Me., is engineer.

Lewiston, N. Y., LeGrand McConkey, supervisor, closes bids Oct. 24 for pipe lines for water systems in Escarpment water district (Contract No. 1), Dickersonville water district (Contract No. 2), and College Heights water district (Contract No. 3). Estimated cost \$51,531.00.

Binghamton, N. Y., plans pipe line extensions and replacements in water systems; also improvements and expansion in pumping plants and other waterworks installation. Cost about \$1,100,000, of which over \$500,000 has been secured through Federal grant. Barker & Wheeler, 36 State Street, Albany, N. Y., are consulting engineers.

Crab Orchard, Ky., closes bids Oct. 24 for about 15,840 ft., various sizes, for water system; also for 50,000-gal. elevated steel tank and tower, pumping station and other waterworks installation. H. deB. Forbes, Richmond, Ky., is consulting engineer.

Campbellsville, Ky., plans pipe lines for water system and other waterworks installation, including 50,000-gal. elevated steel tank on 124-ft. steel tower. Cost about \$60,000, of which \$28,000 will represent a Federal grant.

Rock Island, Ill., asks bids until Oct. 27 for pipe line extension in water system (Contract C). Federal Engineering Co., Central Office Building, Davenport, Iowa, is consulting engineer. Financing has been arranged through Federal aid.

Bonduel, Wis., has received PWA grant of \$34,363 toward cost of building new water-

works and sewerage system. Helmuth Wusow is clerk.

Kenosha, Wis., has received PWA grant of \$424,636 for municipal waterworks improvements, including cast iron pipe. H. C. Laughlin is city engineer.

Racine, Wis., has been allotted PWA grant toward waterworks improvements, including pipe, pumps, filtration plant, etc., to cost about \$258,000. Alvord, Burdick & Howson, 20 North Wacker Drive, Chicago, are consulting engineers.

Black Creek, Wis., has applied for PWA grant toward new waterworks and sewerage systems estimated to cost \$103,636. Project is in charge of A. E. McMahon Engineering Co., Menasha, Wis.

Council Grove, Kan., plans about four miles of 8-in. for main water line from new water source on Conning Creek, where dam will be constructed; also pipe lines for distribution in municipal limits. Fund of about \$238,000 is being arranged through bond issue and Federal aid for this and other waterworks installation. S. A. Sulentic, New England Building, Topeka, Kan., is consulting engineer.

Meadville, Mo., plans pipe lines for water system and other waterworks installation. Cost about \$53,250, of which \$23,962 will represent a Federal grant. R. Warren Roberts, Court House, Chillicothe, Mo., is consulting engineer.

Salina, Okla., plans about 19,500 ft. of 2, 4, 6 and 8-in. for water system; also 40,000-gal. elevated steel tank and tower, pumping machinery and other waterworks equipment. Financing has been arranged through Federal aid.

Newport Beach, Cal., has called special election Oct. 31 to approve bond issue for pipe lines for water system, and other waterworks installation. Cost about \$141,800. R. L. Patterson is city engineer.

Delano, Cal., has awarded 111 tons of 4 and 6-in. pipe to Pacific States Cast Iron Pipe Co., Provo, Utah, through contractor.

Yakima, Wash., has opened bids on 2124 ft. of 12-in. and 12,024 ft. of 6-in. pipe for water main construction.

Purchasing Officer, Panama Canal, Washington, asks bids on 18,702 ft. of cast iron pipe (Schedule 3990).

Tucson, Ariz., asks bids Oct. 22 on Unit 3 of water system, involving 5270 ft. of 2 to 16-in. cast iron pipe and the following sizes with cast iron, steel, and transite alternates: 26,950 ft. of 4 to 12-in., 8900 ft. of 16-in. and 2400 ft. of 20-in.

Is corrosion a factor in your plant or your customer's plant?

You will be interested in these alloys for corrosion resistance:

Duriron will handle sulfuric, nitric, phosphoric, acetic and other commercial acids in all strengths at all temperatures. (Durichlor for muriatic acid).

Available in Duriron are pumps, valves, pipe and fittings, steam jets, heat exchangers and other standard items as well as special castings.

Durimet, a machinable nickel-chrome low-carbon alloy steel (stainless), is recommended for sulfuric and other acids in all concentrations, and for all strengths and temperatures of caustic solutions.

Durco Stainless Steels (low-carbon 18% chrome, 8% nickel series) and special alloys of the chrome-nickel and chrome-iron series are available in standard equipment and in special castings made to your order.

Consider The Duriron Company as a source of supply for corrosion-resisting equipment. Our facilities for the production of corrosion-resisting alloys and equipment are extensive.

Send us your inquiries, blue prints or specifications.

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Stainless Steels

THE DURIRON COMPANY, Inc.
438 N. Findley Street Dayton, Ohio

Deere Executive Finds Business Declines 25%

CHICAGO.—Rather slow business for the farm equipment industry in the first half of 1939 compared with the like periods of 1937 and 1938 was forecast this week by Charles Deere Wiman, president, Deere & Co., Moline, Ill. If crops and prices are favorable next spring improvement may be expected in the last half of next year, Mr. Wiman said.

The Deere executive told the 45th annual convention of the Farm Equipment Institute at French Lick Springs, Ind., that 1938 sales will run 25 to 30 per cent under last year, the decline being in sales of tractors, attachments and parts. Sales of other items of farm equipment were higher than last year, he said.

Sheet & Tube Orders Mesta, United Mills

YOUNGSTOWN.—Contracts totaling several million dollars have been awarded by Youngstown Sheet & Tube Co. for considerable of the new mill equipment which will be installed at the Indiana Harbor works, East Chicago, Ind.

Mesta Machine Co., Homestead, Pa., has been awarded the 54-in. hot strip mill. United Engineering & Foundry Co., Pittsburgh, will build the 4-stand tandem cold mill and also the new 46-in. by 96-in. blooming mill.

Electrical equipment for the new mills, while not yet awarded, will be divided between Westinghouse Electric & Mfg. Co., General Electric Co., and the Allis-Chalmers Co.

A convertible debenture bond issue, recently sold, is providing the money for this work.

The general contract for foundations has not been awarded. The construction will require 7500 tons of structural steel, negotiations for which now are being conducted.

Officials expect to start work soon. Several old buildings will be replaced and are now being torn down. Foundation work will be started as soon as the general contract is awarded.

Completion of the improvement is expected by July 1, 1939.

Court Upholds Sentences For 39 Fansteel Strikers

CHICAGO.—The State Supreme Court this week upheld jail sentences and fines for 39 men who refused to leave the Fansteel Metallurgical Corp.'s plant in North Chicago during a strike directed by CIO organizers. Those sentenced were members of the Amalgamated Association of Iron, Steel & Tin Workers, an affiliate of the SWOC and CIO.

Myer Adelman, a CIO organizer, was fined \$1,000 and sentenced to 240 days in jail. Oakley Mills, another organizer, was fined \$500 and sentenced to 180 days in jail.

Wisconsin Foundries Combine Sales Forces

SALES forces of the Liberty Foundry, Inc., Wauwatosa, Wis., Spring City Foundry Co., Waukesha, Wis., and the Milwaukee Steel Foundry Co., Milwaukee, have been united into a single unit in an effort to pro-

mote a more aggressive sales policy, according to W. J. Grede, president of Liberty Foundry.

Each of the three non-competing foundries will continue as an individual producer, but the sales and technical facilities of each will be available through one channel.

Republic Builds New Oil Recovery Plant

YOUNGSTOWN.— Construction of a new light oil recovery plant at Youngstown has been announced by Republic Steel Corp. Work will start immediately. This Koppers Co. plant will have the capacity to treat gas from 4300 tons of coal coked per day.

New equipment will include a wash oil still and auxiliaries, wash oil pumps and tanks, and a water cooling tower and water re-circulating system.

The first coke was pushed Oct. 18 from Republic's new battery of 69 coke ovens here. These replaced an old battery of 61 ovens. Two weeks ago a new 1000-ton blast furnace, replacing an old 500-ton furnace, was blown in. Last week extensive changes to the blooming mill were completed.

Acme Steel Co., Chicago, reports net income of \$110,007 for the quarter ended Sept. 30, 1938, compared with \$305,863 for the corresponding period last year, and \$62,170 for the second quarter this year. Net for the nine months ended Sept. 30 was \$173,146 as against \$2,070,245 for the comparable 1937 period.



FOR FASTER

FLAT FILLET WELDING!

● Now you can speed up flat fillet welding on production work — with a new rod that produces a surprisingly smooth weld of unusually high ductility. ● You will be impressed with the way the metal flows from HI-TENSILE "G", with the very small spatter and slag losses and with the way the finished job stands inspection. Meets all A.W.S. specifications, Grade 10. ● Your local Page distributor will show you many advantages that HI-TENSILE "G" makes possible.



PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE COMPANY, Inc.
MONESSEN, PENNSYLVANIA

In Business for Your Safety

PAGE Welding WIRE

Rearmament Expands Machinery Demand, Van Deventer Finds

EXPRESSING encouragement over the fact that purely "miscellaneous uses" of steel have contributed largely to the sustained rise in steel ingot production, John H. Van Deventer, editor, *THE IRON AGE*, told members of the Chicago chapter of the American Society for Metals, Thursday night at the Medinah Athletic Club, that a rate of nearly 60 per cent is likely before the end of October.

"This miscellaneous division is the division that you should watch if you wish to obtain an insight into our industrial economic outlook," Mr. Van Deventer said, as he pointed out the importance to all heavy consuming industries of a broad miscellaneous demand.

Foreign sales of machinery and mechanical products will be stimulated, Mr. Van Deventer states, because

"Herr Hitler, without firing a shot, has won the war that Mr. Chamberlain prevented." Now that world peace apparently demands equality at least, if not superiority in armed forces, other European nations and this country as well will continue their armament programs, he said. Production machinery will be in great demand, "and this armament rush will have its effect upon the businesses of every one of you, because armament, from start to finish, means metals," the editor added.

Decentralization Seen

Mr. Van Deventer told of Germany's huge steel works, now under construction by the H. A. Brassert Co., where low grade ores containing about 30 per cent iron will be utilized by special processes. Such processes here might well encourage decentrali-

zation of steel production to sections of the country where low grade ore abounds, and where recent basing point changes might make location advantageous.

Some Chicago district contributions to the metal world include such advances as "Inland Steel Co.'s new lead-containing open hearth steel, for which claims of 20 per cent greater machinability are made . . . the only electro-tinning plant in the world that seems to be turning out material for commercial consumption . . . and the rolling of white case iron billets into plates, bars and shapes," Mr. Van Deventer said.

GREAT BRITAIN.

. . . Improvement seen in Continental and British markets.

LONDON, Oct. 18, (By Cable).—The development in general Continental steel business has been maintained, but with less speculation prominent. Scandinavia, Holland and Egypt, which bought feverishly during the crisis, are still buying well.

British iron and steel business is improving slowly with rising outputs, but consumers are only interested in this year's delivery, believing first quarter prices must be reduced. There is much uncertainty in manufacturing quarters owing to recent increased costs. Nov. 1 has been indicated as the probable date for the official announcement of 1939 prices.

The spurt in buying of air raid precaution equipment was short lived, but the defense program is likely to call for increasing quantities of steel.

The tin plate market is moderately active with unfilled orders now over 2,250,000 base boxes.

The market for black sheets is dull. Galvanized sheet market is quiet. Prices to South Africa and Rhodesia have been reduced 10s. to £16, 5s. f.o.b.

September iron and steel imports amounted to 61,800 tons, of which 4500 tons came from the United States. Exports of pig iron amounted to 7200 tons, of which none went to the United States. Total exports of iron and steel amounted to 138,000 tons, of which 150 tons went to the United States. Tin plate exports amounted to 22,000 tons; galvanized sheets to 12,500 tons; black sheets to 3800 tons.

Industry Speaks

WILLIAM J. KELLY, president, Machinery and Allied Products Institute—"Any man who has spent much of his life around a machine-shop has at some time developed an idea or seen someone develop a product on which he was willing to gamble a few hundred or a few thousand dollars because he saw the possibility of making a fortune. Most of our businesses started that way. They would

never have come into existence except for the venturing of somebody's savings."

WALTHER FUNK, German economics minister—"We buy more than twice as much from Southeastern Europe as Britain, France and the United States put together. Incorporation of the Sudeten German economy, which has a close connection with Southeastern Europe, will only increase the German share."

Industry Listens

"We have preponderant world forces upon our side. They have to be combined to be obeyed. France must start. Britain must start. America must start. If through an earnest desire for peace we have placed ourselves at a disadvantage, we must make up for it by redoubled exertion and, if need be, by fortitude in suffering." — **WINSTON CHURCHILL**, Great Britain's former first lord of the admiralty.

"I dislike digging up fossil bones of dead mandates. But I must take the bunk out of this mandate stuff. Their (the New Deal's) platform of 1932 had something in it about reduction of government expenditures, economy and balanced budget. From what the New Deal has left of that skeleton you cannot even make out what the animal was." — **HERBERT HOOVER**.

Government Causes "Suicidal" Steel Price Cuts, A.S.T.E. Told

THE American Society of Tool Engineers held its semi-annual meeting at the William Penn Hotel, Pittsburgh, Oct. 14 and 15.

Youngest of all of our technical or professional societies, the A.S.T.E. has attained, in six years since its formation, a membership of nearly 3000 and has established chapters in more than 24 cities. Pittsburgh chapter No. 8 was host for this meeting, under the chairmanship of Gregory Grace.

Attendance at Pittsburgh established a record for semi-annual meetings of the society, some 600 members and guests being present at the sessions.

Plant tours were conducted on Friday, Oct. 14, to Westinghouse Electric & Mfg. Co., Homestead Works of United States Steel Corp., Aluminum Co. of America and Mellon Institute.

At the semi-annual dinner on Friday night, President Walter F. Wagner, master mechanic of Lincoln Motor Car Co., announced plans for the exhibition to be held in March, 1939. Mr. Wagner expects that attendance at this forthcoming exhibition will be over 60,000, or approximately double that of the 1938 exhibition.

J. R. Weaver, first vice-president of the A.S.T.E. and director of equipment inspection and test of Westinghouse Electric & Mfg. Co., acted as toastmaster at the dinner which was addressed by John H. Van Deventer, editor of THE IRON AGE, who spoke on "Tools, Taxes and Wages."

Mr. Van Deventer, in pointing out the encouraging and the discouraging features of the immediate outlook condemned the recent slashing of sheet steel prices as having the possibility of serious public consequences as well as being suicidal to the industry.

"At the present prices," said the speaker, "I doubt if there is a single sheet producer who could break even at an operating rate of 80 per cent." He attributed the price slashing hysteria to a state of mind caused by constant pressure upon the industry by Government bureaus and officials, who are adverse to price stabilization policies.

"Strangely enough," said Mr. Van Deventer, "while advocating low prices for private industry, Government, the biggest monopoly of all business, has continuously increased its

prices to its customers, the taxpayers."

At the technical session on Saturday morning, L. W. Chubb, director of research, Westinghouse Electric & Mfg. Co., spoke on "Industrial Advancement through Scientific Research."

REINFORCING STEEL

*... Awards of 11,015 tons;
10,100 tons in new projects.*

NORTH ATLANTIC STATES

AWARDS

1400 Tons, Rochester, N. Y., camera building for Eastman Kodak Co., to Bethlehem

Steel Co., Bethlehem, Pa., through A. W. Hopeman & Sons, contractors.

1200 Tons, Buffalo, Lakeview housing project, to Bethlehem Steel Co., Bethlehem, Pa., through John W. Cowper Co., Buffalo, contractor.

735 Tons, New York, Treasury Department requirements, to Concrete Steel Co., New York.

575 Tons, Washington, Calvin Coolidge School, to American Steel Engineering Co., Philadelphia, through McCloskey & Co., contractors.

260 Tons, Bethesda, Md., National Cancer Institute, to Sweets Steel Co., Williamsport, Pa., through George A. Fuller Co., contractor.

100 Tons, New Haven, Conn., Ferry Street bridge, to Bethlehem Steel Co., Bethlehem, Pa., through C. W. Blakeslee & Son, New Haven, Conn.

CENTRAL AND WESTERN STATES

720 Tons, Methow, Wash., highway bridges, to Bethlehem Steel Co., Seattle, through Roy L. Bair, Spokane, Wash., general contractor.

630 Tons, Los Angeles, continued treatment buildings for Veterans' Administration, to Soule Steel Co., Los Angeles, through

Republic's Modernized 1000-ton Blast Furnace at Youngstown



THIS illustration shows Republic Steel Corp.'s newly-completed 1000-ton blast furnace at the company's Youngstown plant. The new stack replaces one of 500 tons capacity and was lighted by Mayor Lionel Evans of Youngstown.

- Robert E. McKee, Los Angeles, contractor.
- 500 Tons, Los Angeles, Hancock Building at University of Southern California, to Soule Steel Co., Los Angeles, through P. J. Walker, Los Angeles, contractor.
- 500 Tons, Los Angeles, United States Engineer (Proposal 170), to Bethlehem Steel Co., Los Angeles.
- 350 Tons, Flint, Mich., Buick Motor Co. building, to Truscon Steel Co., Youngstown, through J. A. Utley Co., Detroit, contractor.
- 300 Tons, Pontiac, Mich., hospital, to Bethlehem Steel Co., Bethlehem, Pa., through J. A. Utley, contractor.
- 275 Tons, Rock Island, Ill., waterworks, to Joseph T. Ryerson & Son Inc., Chicago.
- 250 Tons, Kalamazoo, Mich., male and female dormitories, State hospital, to Calumet Steel Co., Chicago.
- 250 Tons, Spadra, Cal., Unit 15 and two custodial buildings, to Blue Diamond Corp., Los Angeles, through John Strona, Pomona, Cal., contractor.
- 225 Tons, Indianapolis, barracks, Fort Benjamin Harrison, to Truscon Steel Co., Youngstown, through S. Wittenberg, Louisville, Ky., contractor.
- 195 Tons, Lafayette, Ind., chemical engineering building, Purdue University, to Truscon Steel Co., Youngstown, through George A. Fuller Co.
- 168 Tons, Albuquerque, N. M., sewage disposal plant, to Capitol Steel Co., Oklahoma City, through Bradbury & Marchant, Albuquerque, contractor.
- 162 Tons, Dover, Ohio, Tuscarawas County bridge, to Carnegie-Illinois Steel Corp., Pittsburgh, through Wendling Brothers, Dover.
- 150 Tons, San Diego, Cal., hospital at Vaulchain Home, to Blue Diamond Corp., Los Angeles.
- 128 Tons, Berdi to Lawton, Nev., highway work, to Columbia Steel Co., San Francisco, through Isbell Construction Co., Reno, contractor.
- 124 Tons, Colton, Cal., Santa Ana River bridge, to Ceco Steel Products Co., Los Angeles, through Vinson & Pringle, Phoenix, Ariz, contractor.
- 119 Tons, Clark and Green Counties, Ohio, State bridge, to Ben Tom Supply Co., Columbus, through Midland Construction Co., Columbus.
- 115 Tons, East Lansing, Mich., men's dormitory, Michigan State College, to Jones & Laughlin Steel Corp., Pittsburgh, through J. A. Utley, contractor.
- 114 Tons, Graham County, Ariz, highway work, to Ceco Steel Products Co., Los Angeles, through Tanner Construction Co., Phoenix, Ariz, contractor.
- 110 Tons, Los Angeles, addition to State office building, to Trojan Steel Co., Los Angeles.
- 105 Tons, Cheney, Wash., State normal school, to Bethlehem Steel Co., Seattle, through J. T. Hallin, Spokane, contractor.
- 104 Tons, Turlock, Cal., irrigation canals, to unnamed companies.
- 100 Tons, Los Angeles, College and Figueroa Streets grade separation, to Ceco Steel Products Co., Los Angeles, through Gibbons & Reed, Burbank, Cal., contractor.
- 100 Tons, Adrian, Mich., school, to Truscon Steel Co., Youngstown, through Krueger-Finn, Inc., Detroit, contractor.
- 100 Tons, Mankato, Minn., Mankato Teachers College, to Paper Calmenson Co., St. Paul, Minn.
- 280 Tons, Rochester, N. Y., Lexington Avenue tunnel.
- 175 Tons, Gloucester, Mass., senior high school foundation; Daniel Cunningham Construction Co., Boston, contractor.
- 160 Tons, Carroll and Grayson Counties, Va., roadway.
- 154 Tons, Scarboro, Me., highway construction.
- 150 Tons, Tioga County, N. Y., mostly mesh, highway project R. C. 3999; Maple City Lumber & Supply Co., Inc., Hornell, N. Y., low bidder.
- 120 Tons, Bogota, N. J., railroad bridge.
- 100 Tons, Newburyport, Mass., stadium.

CENTRAL AND WESTERN STATES

- 1200 Tons, San Diego, Cal., marine barracks (Specification 8909); M. H. Golden, San Diego, contractor.
- 500 Tons, Sacramento, Cal., State office building No. 3; bids Nov. 9.
- 360 Tons, Rockport, Ky., bridge over Green River.
- 350 Tons, San Diego, Cal., mess hall-galley-barracks building at destroyer base.
- 275 Tons, Detroit, Denby School.
- 225 Tons, Kalamazoo, Mich., infirmary, Michigan State Hospital.
- 215 Tons, Bonneville, Ore., fishway and bridge; bids Nov. 10.
- 200 Tons, San Diego, Cal., destroyer base school (Specifications 8900); Charles L. Hoskins, San Diego, contractor.
- 200 Tons, Green Bay, Wis., Washington Junior High School.
- 190 Tons, Pontiac, Mich., addition, State hospital.
- 179 Tons, Clark County, Wash., Lewis River bridge; bids Nov. 1.
- 174 Tons, Corbett, Wyo., Shoshone project (Invitation 48151-A); bids opened.
- 145 Tons, Coalinga, Cal., Sunset Grammar School; bids opened.
- 130 Tons, Wichita, Kan., intermediate school.
- 100 Tons, Cincinnati, flood wall protection.
- Unstated Tonnage, Terre Haute, Ind., foundations for federal prison; bids Oct. 25.

HAWAII

- 850 Tons, Port Allen, wharf and terminal improvements, to Honolulu Iron Works, through E. E. Black, Honolulu, general contractor.

NEW REINFORCING BAR PROJECTS

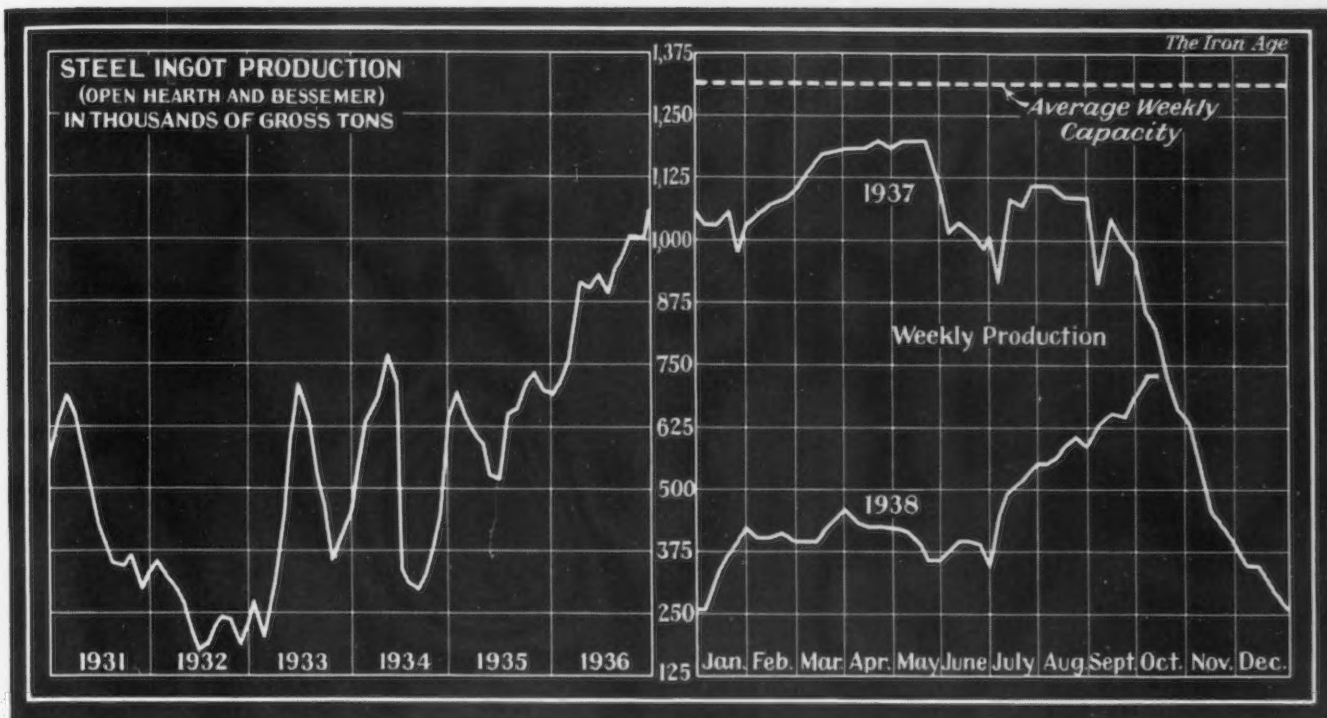
NORTH ATLANTIC STATES

- 1800 Tons, New York, apartment house, 140 Riverside Drive.
- 1200 Tons, Mount Gretna, Pa., rebidding on Security prison; bids close Oct. 25.
- 500 Tons, Coatesville, Pa., White Hill industrial school; J. McShain Corp., Philadelphia, low bidder.
- 400 Tons, Taughannock Falls, N. Y., mesh, highway project R. C. 3997; Bero Engineering & Construction Corp., North Tonawanda, N. Y., low bidder.
- 304 Tons, Schenectady County, N. Y., mostly mesh, highway project R. C. 3996, Law Brothers Contracting Corp., Herkimer, N. Y., low bidder.
- 300 Tons, Dutchess County, N. Y., mesh, highway project R. C. 3994; Ottaviano & McDonald, Inc., Croton-on-Hudson, N. Y., low bidder.

Weekly Bookings of Construction Steel

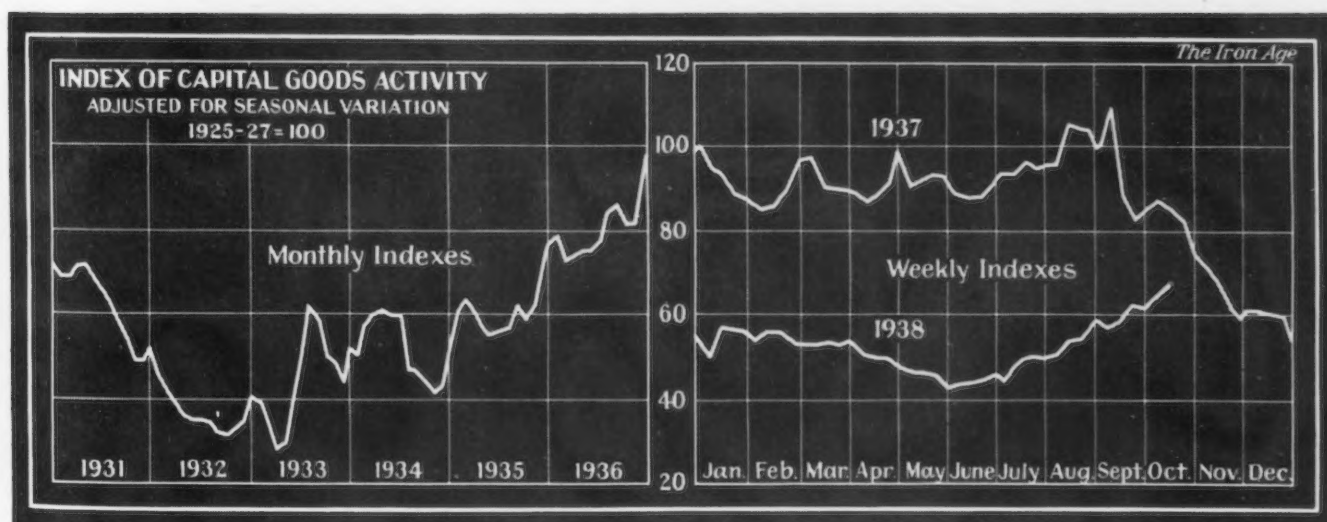
	Week Ended				Year to Date	
	Oct. 18, 1938	Oct. 11, 1938	Sept. 20, 1938	Oct. 19, 1937	1938	1937
Fabricated structural steel awards	11,900	22,200	66,590	5,500	694,470	887,185
Fabricated plate awards	11,790	0	1,555	755	111,430	105,660
Steel sheet piling awards	705	0	1,150	0	37,065	37,395
Reinforcing bar awards	11,015	3,850	17,910	2,000	263,965	230,965
Total Letting of Construction Steel ..	35,410	26,050	87,205	8,255	1,106,930	1,261,205

Ingots Output Declines 1/2 Point to 51 Per Cent



District	Ingots		Pitts-	Chicago	Valleys	Phila-	Cleve-	Wheel-	Buffalo	Detroit	Southern	S. Ohio	Western	St. Louis	East-	Aggre-
Production, Per	CURRENT WEEK..		burgh			delphia	land	ing				River			ern	gate
Cent of Capacity	PREVIOUS WEEK..															
			39.0	46.0	56.0	31.0	59.0	76.0	49.0	77.4	49.0	55.5	50.0	48.0	75.0	51.0
			41.0	46.0	53.0	32.0	53.0	76.0	52.0	64.0	49.0	55.5	50.0	50.0	75.0	51.5

Capital Goods Index Gains Five Per Cent to 68.7



A GAIN of 34 per cent in the week's automobile assemblies was the principal cause of a rise of 3.6 points, or 5 per cent, in THE IRON AGE index of capital goods activity for the week ended Oct. 15. This gain, bringing the index up to 68.7, the highest since the first week of November, 1937, marks a continuation of the gradual improvement in capital goods activity which has been in evidence for the past 20 weeks. With the exception of lumber carloadings, which recorded a seasonal decline in the past week, all the components of the index were higher.

	Week Ended Oct. 15	Week Ended Oct. 8	Comparable Week	
			1937	1929
Steel ingot production ¹	71.6	65.9	87.7	113.1
Automobile production ² ...	80.4	68.5	139.6	120.3
Construction contracts ³	74.5	73.9	52.5	106.9
Forest products carloadings ⁴	57.6	58.4	61.6	115.0
Production and shipments, Pittsburgh District ⁵	59.2	58.8	87.2	116.6
Combined index	68.7	65.1	85.7	114.4

Sources: 1. THE IRON AGE; 2. Ward's Automotive Reports; 3. Engineering News-Record; 4. Association of American Railroads; 5. University of Pittsburgh.

... SUMMARY OF THE WEEK ...

... Flat rolled products down \$2 more, total of \$6.

o o o

... Galvanized sheets \$4 off; cold rolled strip affected.

o o o

... New business gains; automobile tonnage larger; operations 51 per cent.

A FURTHER decline of \$2 a ton in prices of hot and cold rolled sheets, hot rolled strip, enameling sheets and long ternes has developed on top of the \$4 a ton break early last week, making a total reduction of \$6 a ton from the published prices of two weeks ago. The weakness in sheets and strip has extended to cold rolled strip, which is down \$6, and to galvanized sheets, which are \$4 a ton lower. Though none of the steel companies has made public announcement of the current quotations, they are generally recognized as the going prices.

Two of the products affected are components of THE IRON AGE finished steel composite price, which has declined to 2.211c. a lb., which is \$6.02 a ton below the peak level of 1937.

A highly competitive situation exists in wire nails, on which there have been sharp concessions. Some mills have withdrawn quotations below \$2.45 per keg, but the results are still in doubt.

No move has been made by any company toward stabilization of flat rolled products at a higher level than the one prevailing, though one small sheet producer has shut down its mill and withdrawn from the market.

INCOMING tonnage has been variously affected by the price break. In those products that have declined there has been an increased volume of "bargain" buying as many consumers and jobbers recognize the possibility that such low prices may not be long available, but there has been hesitant buying of other products that have not been affected beyond the occasional irregularities prevalent for some weeks. Aggregate bookings of many mills have increased during the past week and are running ahead of those of

September. Automobile tonnage in larger volume is an important factor, but miscellaneous business has also been better. There has been substantial improvement at Chicago.

Some mills are protecting their regular customers over the remainder of the quarter at the new prices, but are stipulating that all specifications must be received in time for completion of shipments by Dec. 31, it being their determination not to carry over any of the low priced business into the first quarter.

An odd situation is the fact that hot rolled sheets at 1.85c. a lb. become 1.70c. with the 150-ton quantity deduction, or \$34 a net ton, which is identical with the gross ton price of sheet bars, placing non-integrated sheet and strip producers in a quandary. So far there is no intimation of a reduction in semi-finished steel.

Whether the price decline will have any repercussions on steel wages is an open question, but a wage cut appears to be as far away as it was before the price break, notwithstanding the fact that steel companies' losses in fourth quarter may be larger than in the third quarter even with higher operating rates.

Ingot production is off a half point this week to 51 per cent, a decline that has no significance in view of the increasing volume of new business. The importance of a larger volume of automobile orders is indicated at Detroit, where Great Lakes Steel Corp. has 15 of its 16 open hearths in use. There have been gains elsewhere, notably at Lorain and Youngstown, which are offset by losses in some districts, especially Pittsburgh, which is down two points. Pig iron production is headed toward a further gain as the Carnegie-Illinois Steel Corp. blows in two blast furnaces this week, one at Youngstown and one at Braddock, Pa.

Though mill specifications for structural steel and other building requirements are gaining as a result of recent lettings, there has been a lull in new awards, which amounted only to 12,000 tons in the week, while new projects totaled less than 17,000 tons. Reinforcing steel awards were 11,000 tons and new projects call for 10,000 tons.

Railroad car builders have had an informal inquiry from the Southern Railway, which is considering the purchase of 2400 freight cars. There is no rail buying except for 3000 tons ordered by the Mobile & Ohio.

Pig iron shipments are gaining moderately. The largest order was 10,000 tons for export to Italy.

Steel scrap is 50c. a ton lower at Pittsburgh, based on a mill purchase, but has strengthened 25c. at Chicago. THE IRON AGE scrap composite price is 8c. a ton lower at \$14.17.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Oct. 18, 1938	Oct. 11, 1938	Sept. 20, 1938	Oct. 19, *1937
Rails, heavy, at mills.....	\$40.00	\$40.00	\$40.00	\$42.50
Light rails: Pittsburgh, Chicago, Birmingham.....	40.00	40.00	40.00	43.00
Rerolling billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point.....	34.00	34.00	34.00	37.00
Sheet bars: Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point.....	34.00	34.00	34.00	37.00
Slabs: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point.....	34.00	34.00	34.00	37.00
Forging billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.....	40.00	40.00	40.00	43.00
Wire rods: Nos. 4 and 5, Pittsburgh, Chicago, Cleveland.....	43.00	43.00	43.00	47.00
Skelp, grvd. steel: Pittsburgh, Chicago, Youngstown, Coatesville, Sparrows Point, cents per lb.....	1.90	1.90	1.90	2.10

Finished Steel

Cents Per Lb.:	Oct. 18, 1938	Oct. 11, 1938	Sept. 20, 1938	Oct. 19, *1937
Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham.....	2.25	2.25	2.25	2.45
Plates: Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont.....	2.10	2.10	2.10	2.25
Structural shapes: Pittsburgh, Chicago, Gary, Buffalo, Bethlehem, Birmingham.....	2.10	2.10	2.10	2.25
Cold finished bars: Pittsburgh, Buffalo, Cleveland, Chicago, Gary.....	2.70	2.70	2.70	2.90
Hot rolled strip: Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown, Birmingham.....	1.85	1.95	2.15	2.40
Cold rolled strip: Pittsburgh, Cleveland, Youngstown.....	2.65	2.95	2.95	3.20
Sheets, galv., No. 24: Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown, Birmingham.....	3.30	3.50	3.50	3.80
Hot rolled sheets: Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown.....	1.85	1.95	2.15	...
Cold rolled sheets: Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown.....	3.05	3.05	3.20	...

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Cents Per Lb.:	Oct. 18, 1938	Oct. 11, 1938	Sept. 20, 1938	Oct. 19, *1937
Wire nails: Pittsburgh, Chicago, Cleveland, Birmingham.....	2.45	2.45	2.45	2.75
Plain wire: Pittsburgh, Chicago, Cleveland, Birmingham.....	2.60	2.60	2.60	2.90
Barbed wire, galv.: Pittsburgh, Chicago, Cleveland, Birmingham.....	3.20	3.20	3.20	3.40
Tin plate, 100 lb. base box: Pittsburgh and Gary.....	\$5.35	\$5.35	\$5.35	\$5.35

*Pittsburgh prices only.

Pig Iron

Per Gross Ton:	Oct. 18, 1938	Oct. 11, 1938	Sept. 20, 1938	Oct. 19, *1937
No. 2 fdy., Philadelphia.....	\$22.84	\$22.84	\$21.84	\$25.76
No. 2, Valley furnace.....	21.00	21.00	20.00	24.00
No. 2, Southern Cin'tl.....	21.06	21.06	20.06	23.69
No. 2, Birmingham.....	17.38	17.38	16.38	20.38
No. 2, foundry, Chicago.....	21.00	21.00	20.00	24.00
Basic, del'd eastern Pa.....	22.34	22.34	21.34	25.26
Basic, Valley furnace.....	20.50	20.50	19.50	23.50
Malleable, Chicago.....	21.00	21.00	20.00	24.00
Malleable, Valley.....	21.00	21.00	20.00	24.00
L. S. Charcoal, Chicago.....	28.34	28.34	28.34	30.04
Ferromanganese, seab'd carlots.....	92.50	92.50	92.50	102.50

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:	Oct. 18, 1938	Oct. 11, 1938	Sept. 20, 1938	Oct. 19, *1937
Heavy melting steel, P'gh.....	\$14.75	\$15.25	\$15.25	\$16.25
Heavy melting steel, Phila.....	14.75	14.75	14.25	16.25
Heavy melting steel, Ch'go.....	13.00	12.75	13.25	14.25
Carwheels, Chicago.....	13.25	13.25	13.75	16.75
Carwheels, Philadelphia.....	16.75	16.75	17.25	18.75
No. 1 cast, Pittsburgh.....	15.50	15.50	15.50	18.25
No. 1 cast, Philadelphia.....	16.75	16.75	16.25	18.75
No. 1 cast, Ch'go (net ton).....	12.25	12.25	12.75	13.00
No. 1 RR. wrot., Phila.....	15.25	15.25	15.25	19.25

Coke, Connellsville

Per Net Ton at Oven:	Oct. 18, 1938	Oct. 11, 1938	Sept. 20, 1938	Oct. 19, *1937
Furnace coke, prompt.....	\$3.75	\$3.75	\$3.75	\$4.25
Foundry coke, prompt.....	4.75	4.75	4.75	5.00

Non-Ferrous Metals

Cents per Lb. to Large Buyers:	Oct. 18, 1938	Oct. 11, 1938	Sept. 20, 1938	Oct. 19, *1937
Electrolytic copper, Conn.....	11.25	10.75	10.375	12.00
Lake copper, New York.....	11.375	10.875	10.50	13.125
Tin (Straits), New York.....	42.25	44.875	43.70	47.875
Zinc, East St. Louis.....	5.05	4.95	4.95	6.00
Zinc, New York.....	5.44	5.34	5.34	6.35
Lead, St. Louis.....	4.95	4.95	4.95	5.35
Lead, New York.....	5.10	5.10	5.10	5.50
Antimony (Asiatic), N. Y.....	14.00	14.00	14.00	18.25

The Iron Age Composite Prices

Finished Steel

October 18, 1938
One week ago
One month ago
One year ago

	2.211 a Lb.
Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.	

	HIGH	LOW
1938.....	2.512c, May 17	2.211c, Oct. 18
1937.....	2.512c, Mar. 9	2.249c, Jan. 4
1936.....	2.249c, Dec. 28	2.016c, Mar. 10
1935.....	2.062c, Oct. 1	2.056c, Jan. 8
1934.....	2.118c, Apr. 24	1.945c, Jan. 2
1933.....	1.953c, Oct. 3	1.792c, May 2
1932.....	1.915c, Sept. 6	1.870c, Mar. 15
1931.....	1.981c, Jan. 13	1.883c, Dec. 29
1930.....	2.192c, Jan. 7	1.962c, Dec. 9
1929.....	2.223c, Apr. 2	2.192c, Oct. 29
1928.....	2.192c, Dec. 11	2.142c, July 10
1927.....	2.402c, Jan. 4	2.212c, Nov. 1

Pig Iron

\$20.61 a Gross Ton
20.61
19.61
23.25

Based on average basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

	HIGH	LOW
23.25, June 21	\$19.61, July 6	
23.25, Mar. 9	20.25, Feb. 16	
19.73, Nov. 24	18.73, Aug. 11	
18.84, Nov. 5	17.83, May 14	
17.90, May 1	16.90, Jan. 27	
16.90, Dec. 5	13.56, Jan. 3	
14.81, Jan. 5	13.56, Dec. 6	
15.90, Jan. 6	14.79, Dec. 15	
18.21, Jan. 7	15.90, Dec. 16	
18.71, May 14	18.21, Dec. 17	
18.59, Nov. 27	17.04, July 24	
19.71, Jan. 4	17.54, Nov. 1	

Steel Scrap

\$14.25 a Gross Ton
14.25
14.25
15.58

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	LOW
\$14.83, Aug. 9	\$11.00, June 7	
21.92, Mar. 30	12.92, Nov. 16	
17.75, Dec. 21	12.67, June 9	
13.42, Dec. 10	10.33, Apr. 23	
13.00, Mar. 13	9.50, Sept. 25	
12.25, Aug. 8	6.75, Jan. 3	
8.50, Jan. 12	6.43, July 5	
11.33, Jan. 6	8.50, Dec. 29	
15.00, Feb. 18	11.25, Dec. 9	
17.58, Jan. 29	14.08, Dec. 3	
16.50, Dec. 31	13.08, July 2	
15.25, Jan. 17	13.08, Nov. 22	

... THIS WEEK'S MARKET NEWS ...

STEEL OPERATIONS

... Average for country declines slightly ... Detroit up sharply

THE average for the country in steel ingot production this week is estimated by THE IRON AGE at 51 per cent, off half a point from last week. The estimate of the American Iron and Steel Institute, issued on Monday, predicted a rate of 49.4 per cent for the week.

DETROIT has shown a sharp increase, rising to more than 77 per cent from 64 per cent last week. The Great Lakes Steel Corp. is now operating 15 of its 16 open hearths, or nearly 94 per cent for that plant. This gain is attributable mostly to the gain in automobile tonnage, though the stove and refrigerator industries have also contributed.

PITTSBURGH operations are off two points to 39 per cent, but CHICAGO is steady at 46 per cent. The drop at PITTSBURGH is not considered significant. The WHEELING-WEIRTON area continues at 76 per cent. At YOUNGSTOWN there has been a rise of three points to 56 per cent, while increased operations at LORAIN have raised the CLEVELAND-LORAIN rate six points to 59 per cent, with a further rise expected next week. In SOUTHERN OHIO the rate is 55.5 per cent, same as last week, but this is the year's highest in that district, where 18 or 33 open hearths are in operation. BIRMINGHAM district plants operated 12 open hearths last week, with 13 scheduled for this week.

Principal losses are at BUFFALO, which is down to 49 per cent, Bethlehem having dropped two open hearths while Republic added one, and in EASTERN PENNSYLVANIA, where Lukens Steel has taken off two furnaces and Central Iron & Steel has taken off one.

NEW BUSINESS

... Chicago district leads further upswing in demand

ORDERS for steel at CHICAGO have improved substantially this week with sellers more optimistic than at any time this year as a result of increased specifications from automobile plants and miscellaneous manufac-

turing establishments. Building construction is gaining in the Mid-West and CHICAGO industry, with its \$40,000,000 subway now assured and Youngstown Sheet & Tube Co. expanding its CHICAGO district properties, is hopeful of better times. Originally it was estimated that the subway would require 35,000 tons of steel.

At PITTSBURGH new business in steel products other than flat rolled has been hesitant due to the highly unsettled sheet price structure, yet total bookings during the past week were in excess of a week ago and October to date is running ahead of September. Lower flat rolled prices have brought out considerable tonnage due, in part, to a belief that recent cuts may be restored.

Sheet and strip tonnage has gained heavily at CLEVELAND and YOUNGSTOWN, partly because of lower prices. A considerable shant of the incoming specifications are for immediate use. Demand for alloy products, tubular goods, wire and merchant bars is holding up fairly well at these centers. Publicly financed construction projects continue to supply substantial support for northern Ohio steel producers.

The PACIFIC COAST market is in a lull, with principal activity in reinforcing bars, and fabricated steel expected to gain with award of general contracts on the Tacoma, Wash., Narrows bridge and the Colorado River Aqueduct, Los Angeles. Los Angeles Department of Water and Power Transmission towers, totaling about 12,000 tons, will be bid Nov. 15. BIRMINGHAM reports a good demand for steel products, while ST. LOUIS shows improvement in demand for finished products although buying still is confined largely to immediate needs.

Requirements for heavy products predominate at BUFFALO, where bar demand has strengthened considerably and activity in sheets and strip has been dull due to slowness of automobile orders.

Meanwhile demand for steel in the NEW YORK area continues to show improvement, particularly for sheets, in which buyers apparently consider present low prices for flat rolled as "bargain days" unlikely to last. Most sales offices find October running somewhat ahead of September in new business.

PRICES

... Last week's break of \$4 on sheets and strip followed by another of \$2

THE break of \$4 a ton early last week on hot and cold rolled strip, hot and cold rolled sheets, enameling sheets and long ternes was closely followed by an additional \$2 reduction, characterized by producers as "meeting a situation." Quotations have been given on a spot basis, subject to change without notice, and the opinion is growing in some quarters that the present low prices will be temporary. This belief has extended to some consumers, who have placed business, although they had not been in the market at the time the price break occurred.

Galvanized sheet prices, which heretofore have been weak only in spots, are now generally down \$4 a ton from the recently published quotation. So far irregularities in products other than flat rolled have not resulted in outright price cuts.

The question of contracts at the new prices has arisen in a number of instances. Some mills have agreed to cover their regular customers at the reduced prices over the remainder of the quarter, but they stipulate that all specifications must be received in time for the completion of shipments by Dec. 31. There is apparently a determination among some companies that none of the low priced business shall be carried over into the first quarter.

An unusual result of the price reductions is the complaints that have come from a good many consumers of sheets and strip, who, though they make a saving on their purchases, may lose that much or more on their own manufactured products, many of which are in as highly a competitive a price position as flat rolled steels.

At least one sheet producer has temporarily withdrawn from the market as a result of the price break. The Worth Steel Co., Claymont, Del., which makes heavy hot rolled sheets in addition to plates, has shut down its sheet mills for an indefinite period and is out of the sheet market, orders on the books being filled from stock.

An effort is being made by some

producers of wire nails to firm up prices to the published levels of \$2.45 per 100 lb. keg to the trade and \$2.25 to jobbers. There have been concessions recently of a few dollars a ton.

SEMI-FINISHED STEEL

... Sales are smaller because of break in sheet prices

THE recent break in sheet prices, now amounting to \$6 a ton, has raised a difficult problem for non-integrated makers of sheets and the companies that supply them with sheet bars. The current base price of 1.85c. a lb. for hot rolled sheets becomes 1.70c. when \$3 a ton is deducted for lots of 150 tons or more shipped at one time to one destination. This is \$34 a net ton compared with the current price of \$34 a gross ton for sheet bars. There has been no break in the sheet bar price structure, but obviously non-integrated sheet makers cannot afford to take the heavy losses that would be incurred through conversion of \$34 sheet bars into sheets that can be sold at approximately the same price. In such circumstances non-integrated mills are naturally hesitant about buying, and orders have slowed up as a result.

Export prices for sheet bars are so low that mills are not much interested in several inquiries that have appeared recently.

PIG IRON

... More blast furnaces go in ... Merchant shipments gain

DESPITE this week's slight recession in steel ingot production, pig iron making continues to gain. This week the Carnegie-Illinois Steel Corp. will blow in an additional furnace at Edgar Thomson works, Braddock, Pa., and one at the Ohio works, Youngstown, because of increased iron requirements for steel making.

There is an upward trend in merchant pig iron shipments. At CHICAGO October shipments of both pig iron and foundry coke are running about 20 per cent better than during the like period of September, and sellers expect that the acceleration will continue through November and December. Each day recently shipments from CLEVELAND, YOUNGSTOWN and PITTSBURGH furnaces have been a little better, October deliveries as a whole showing a moderate gain over those of

Market Sidelights

THE new General Motors parts plant at West Trenton, N. J., which it is expected will provide an outlet for substantial tonnages of sheets and strip for Philadelphia sales offices, is gradually getting into production. Supplies for this plant are at present being bought from the corporation's Detroit office, but it is anticipated that a purchasing department will be established at West Trenton in the near future.

* * *

Some major steel companies are attributing 75 to 80 per cent of the recent rise in steel production to buying related directly or indirectly to automobile manufacture.

* * *

Old buildings are being razed as Youngstown Sheet & Tube Co. prepares the site at its Indiana Harbor, Ind., plant for a new hot strip mill, blooming mill and cold tin mill. Work on the foundations is expected to start shortly and an inquiry for 7500 tons of structural shapes has been issued.

* * *

Operations were resumed Oct. 17, at the Tennessee Coal, Iron & Railroad Co.'s ore mine No. 9 at Wenonah. The mine had been idle since June 21. This resumption of operations gave employment to approximately 125 men.

* * *

No. 6 battery of coke ovens at Fairfield coke works of Tennessee Coal, Iron & Railroad Co. was placed in production Thursday, Oct. 13, after several weeks of inactivity. The battery included 77 ovens and brought the company's coke operations to capacity.

September. Melting activities in the EASTERN PENNSYLVANIA area are also improving, with consequent improvement in shipments of iron.

A different picture is presented in the ST. LOUIS area, where shipments are low because large users have been holding down inventories and not taking in their usual quantities. In NEW ENGLAND also no improvement is reported, the foundry melt being well below normal and spotty. There have been small gains in production of castings for textile machinery, sugar machinery, electrical appliances, refrigeration and air conditioning, but NEW ENGLAND jobbing foundries are operating spasmodically.

The largest sale of the week was for export. The Alan Wood Steel Co.,

Swedeland, Pa., booked 10,000 tons for shipment to Trieste, Italy. Very few domestic sales have been made at the new prices. The weakness in steel prices has not spread to pig iron since nearly all users are covered to the end of the year at prices in effect prior to the recent \$1 advance.

BOLTS, NUTS, RIVETS

... Orders showing no gain ... Prices ragged in some districts

ORDERS for bolts, nuts and rivets thus far in October closely approximate in total volume those of the like period in September, according to sellers at PITTSBURGH and CLEVELAND. Most jobbers are well stocked for the remainder of the fall, but large manufacturing consumers are a little more active. Better support is expected soon from the automobile industry.

Prices are ragged in some districts, price concessions amounting to 20 per cent or more above the published discounts.

PLATES

... Volume affected by weakness in sheet and strip prices

THE demand for plates has apparently been affected somewhat by the declines in prices of sheets and strip. Thus far the recent weakness in plate prices, which has amounted to occasional concessions of \$2 or \$3 a ton, particularly in the East, has not spread, but at the same time the market has grown no stronger except that some mills have declined orders that have been tendered at a \$2 concession from published prices. A central district mill offered concessions of \$4 a ton last week to a number of buyers in the NEW YORK and PHILADELPHIA territories, but the price was withdrawn within 24 hours with the explanation that a mistake had been made.

All of the plates required for the Criminal Courts Building, New York—about 2400 tons—have been awarded. The tonnage was divided equally between Bethlehem Steel Co. and Seaboard Steel Products Corp., New York, representing an Ohio mill. Plate awards totaling more than 1400 tons were made on the PACIFIC COAST in the past week.

Shipbuilding prospects are promising, but any tonnage to be derived from new awards of ships will not

reach the mills for some months. There is interest in the possibility that the Southern Railway may buy 2400 freight cars.

(Details of fabricated plate awards and inquiries will be found on page 73.)

MERCHANT BARS

... This product not affected by price weakness

A SLOWING down in the rate with which bar orders are being received at CHICAGO is attributed to uncertainties in the minds of buyers arising from the current unsettled situation in the sheet market. Bar prices continue firm, however, and there have been no indications in the CHICAGO territory of a weakness in the price structure. Automobile parts makers, manufacturers of agricultural machinery and tractors and jobbers are chiefly responsible for current bar demand.

Sales of hot rolled bars at PITTSBURGH are about as numerous as a week ago, with some consumers exercising extreme caution because of price irregularities in flat rolled products. Hot rolled bar prices continue firm there.

Demand in CLEVELAND and YOUNGSTOWN districts has remained on a fairly even keel and has been less affected by the unsettled flat rolled price situation than some other products.

STRUCTURAL STEEL

... Largest award is 2400 tons for bridge in Kansas

OUTSTANDING awards of fabricated structural steel in the week were 2400 tons for a railroad bridge over the Cimarron River in Kansas, which went to American Bridge Co., and 1500 tons for a machine shop for Buick Motor Co., Flint, Mich., awarded to Whitehead & Kales Co.

New inquiries include 2200 tons for a municipal court house in Philadelphia, 2000 tons for an industrial school at Coatesville, Pa., 2200 tons for a railroad underpass in Chicago (bids Oct. 21), and 1300 tons for a highway bridge in Oklahoma.

In the NEW YORK and PHILADELPHIA districts there has been a lull in the placing of contracts for the numerous projects already in contrac-

tors' hands. At CHICAGO awards and inquiries are running in smaller individual tonnages, and fabricators there do not expect any considerable volume over the remainder of the year. PITTSBURGH reports that mill specifications for shapes were in smaller volume than in the previous week. On the PACIFIC COAST interest centers in 12,000 tons of shapes and piling required for the Tacoma, Wash., Narrows bridge, and 12,000 tons of shapes for transmission towers on which the Los Angeles Department of Water and Power will take bids Nov. 15. The United States Engineer, Honolulu and San Francisco, has asked for bids by Oct. 20 on 2556 tons of shapes and piling, presumably for use on Midway Island, Pacific Ocean.

Prices being bid on fabricated structural steel jobs are low and highly competitive in all districts.

(Details of fabricated structural steel awards and inquiries will be found on page 73.)

SHEETS AND STRIP

... "Bargain" buying aids tonnage in flat rolled products

THE sharp break in prices of sheets and strip, referred to in detail under the heading "Prices," has resulted in considerable "bargain" buying of these products.

At CHICAGO automobile releases are more prominent than at any time this year. These, with new orders from other sources, have brought up the problem of deliveries, one CHICAGO seller reporting the loss of several hundred tons for refrigerators because shipments could not be made quickly enough. Sheet tonnages at PITTSBURGH are running ahead of those of a month ago and improved during the past week, new business including automobile orders as well as a good many miscellaneous tonnages. At CLEVELAND and YOUNGSTOWN demand for flat rolled products is described as very good. SOUTHERN OHIO mills have booked orders equal to about 50 per cent of capacity, motor car demand having gained considerably. Galvanized sheet orders have shrunk, while orders for other grades have gained. At PHILADELPHIA there has been a gain in orders from auto parts makers, barrel and drum makers and jobbers, practically all specifications covering immediate needs only.

TUBULAR GOODS

... Oil country orders off at Pittsburgh, better in Philadelphia

OIL-COUNTRY goods specifications at PITTSBURGH have declined slightly in the past week and orders so far this month are not as numerous as a month ago. This situation is in line with expectations, owing to seasonal influences in the oil fields. Some pipe makers are balancing out stocks. Standard pipe business continues to increase owing to building activity.

In the PHILADELPHIA district, tubular goods are the only products which have not as yet been affected in sales volume by the price weakness in flat rolled products. On the contrary, buying of oil country items and standard pipe have shown a noticeable gain in the past two weeks and are running considerably in excess of the September volume.

The Orange County Board of Supervisors, Santa Ana, Cal., has taken bids on 250,370 ft. of 4-in. O. D. pipe piles for use in flood control work.

REINFORCING BARS

... Awards are fairly good but prices are very weak

AWARDS of reinforcing bars are in fairly good volume, amounting to 11,000 tons in the past week, but prices are low and weak in most districts.

In the East, where weakness is acute, cuts are sharply below published prices. The price situation in BOSTON is reported to be the most unsettled in many years. During the past week in that city there were cuts from \$6 to \$10.

The quoted resale prices for distributors range from 1.90c. to 2.05c., Sparrows Point, but on a recent job of several hundred tons awarded in NEW YORK the bid price was 1.81c. a lb., New York.

Among the more important awards of the week were 1400 tons for a building for the Eastman Kodak Co., Rochester, N. Y.; 1200 tons for a housing project in Buffalo. Inquiries include 1800 tons for an apartment building in New York and 1200 tons for a prison building at Mt. Gretna, Pa. About 1000 tons of mats and mesh will be required for road work in New York State and New Jersey.

Reinforcing bar specifications received by PITTSBURGH mills are hold-

ing up well, and shipments so far this month are on a par with those of the same period last month. From PITTSBURGH it is reported that prices are weakest in the NEW YORK and NEW ENGLAND areas, while in other districts prices are more or less stabilized at about \$3 below published quotations.

Middle Western building activity is noticeably higher, it is reported from CHICAGO. Federal funds are responsible for many of the projects in that area, but private construction is quite a factor as well. Many of the projects call for less than 100 tons of bars.

The outstanding pending project on the PACIFIC COAST is 5350 tons for the Prado dam, Los Angeles, on which an award is expected momentarily. A Marine Corps barracks at San Diego, Cal., will take 1200 tons.

(Details of reinforcing bar awards and inquiries will be found on page 63.)

WIRE PRODUCTS

... Demand gradually increasing, especially from manufacturers

DEMAND in the CHICAGO district for manufacturers' wire continues to increase each week, showing a slight gain from the previous period. Merchant products are holding their own, but little upward trend is noticeable. Wire sellers are optimistic over business prospects in the CHICAGO area for the remainder of the year, and their expectation of good business runs over into 1939.

Total wire business in the past week at PITTSBURGH has changed but little from the previous week. However, orders so far this month are running slightly ahead of the same period in September.

At CLEVELAND incoming business is about the same as the rate at this time last month, with manufacturers' wire predominantly in demand. Several state, city or Government projects have strengthened activity of fence producers.

RAILROAD BUYING

... Southern Railway may buy 2400 freight cars

IN view of the generally accepted view that not much railroad equipment buying will develop so long as the railroad wage question awaits a final settlement, there is unusual interest in the possibility that the Southern Railway may buy 2400 freight cars in addition to the 5500 that were ordered a few months ago. A formal inquiry has not been issued, but the

Southern has been discussing the matter with car builders. This road, however, has issued a formal inquiry for 20 baggage-express cars. The Navy Department is asking for bids on 42 flat cars and four box cars.

Rail buying has not responded to the recent reduction of price to \$40 a ton. The only order reported during the week was 3000 tons for the Mobile & Ohio, to be furnished by the Tennessee Coal, Iron & Railroad Co.

TIN PLATE

... Buyers awaiting 1939 price announcements

TIN mill products have not been affected by the drop in sheet prices. Meanwhile, tin plate operations for the country continue at 25 to 30 per cent with a slight increase in demand from general line can makers. Otherwise, a strictly hand-to-mouth buying policy by all consumers continues.

At ST. LOUIS, it was stated that users of tin plate are waiting for 1939 prices to be announced before buying for next year. Can manufacturers have been out of the market for some time as a result of heavy commitments when prices were advanced.

... PIPE LINES ...

Bell Oil & Gas Co., Tulsa, Okla., has authorized new welded steel pipe line from oil refinery at Grandfield, Okla., to point near Burkburnett, Tex., with crossing over Red River, for gasoline transmission. A bulk terminal will be built at Burkburnett, including docks and other facilities for water shipments.

Euclid, La., has plans for pipe lines for municipal gas distributing system, with main welded steel pipe line for connection to supply source, control station and other operating facilities. Bond issue of \$115,000 has been approved for project.

Stockdale, Tex., has voted bonds for \$39,000 and will secure Federal loan and grant of \$39,450 for pipe line system for natural gas distribution, including main welded steel pipe line for transmission to municipality, connecting with control station. J. W. Beretta Engineers, Inc., National Bank of Commerce Building, San Antonio, Tex., is consulting engineer.

Arcadia, Cal., plans about 7000 ft. of 14, 16 and 18-in. riveted steel pipe for main supply line in connection with extensions and replacements in water system; also about 26,000 ft. of 6 to 12-in. cast iron pipe, pumping machinery, 2,000,000-gal. reinforced-concrete reservoir and other waterworks installation. Cost about \$145,000, of which city will provide \$79,744 from water department funds, remainder to be secured through Federal aid. G. B. Watson is city engineer.

Texas Pipe Line Co., Texas Building, Houston, Tex., B. E. Hull, president, has let contract to Williams Brothers, Inc., National Bank of Tulsa Building, Tulsa, Okla., for new 8 and 10-in. welded steel pipe line from Salem, Ill., with connecting line from Noble, Ill., both located in recently opened oil field area in southern part of State, to Lawrenceville, Ill., about 80 miles, for crude oil transmission to company oil refinery at last noted

point. About 60 miles of new line will be 8-in. and remainder 10-in.; pipe will be furnished by owner. Pumping stations will be installed at points along route, with main pumping plant in oil field for booster service. New line will be operated by Central States Pipe Line Co., Tulsa, Okla., a subsidiary of first noted company, which is an interest of Texas Co., Houston. Cost close to \$500,000.

Alberta Petroleum Association, Calgary, Alta., R. A. Brown, chairman, is at head of project to build new welded steel pipe line from point near Calgary, connecting with Turner Valley oil field, to Fort William, Ont., and vicinity, for crude oil transmission. Cost over \$10,000,000 with booster pumping stations and other operating facilities. It is proposed to proceed with project early next year and to organize a pipe line company to carry out work. Another welded steel pipe line for similar service is projected from Calgary west to a point near Vancouver, B. C., to cost approximately \$13,000,000.

Orange County Board of Supervisors, Santa Ana, has opened bids on 250,370 ft. of 4-in. o.d. pipe piles for use in flood control work.

Closed Shop Rare, Checkoff Not Legal in Britain, Voss Reports

AKRON, OHIO.—"The British labor attitude has developed to the point where a spirit of cooperation between employer and employee, with a minimum of governmental interference, is generally viewed as the policy most in the public interest," J. A. Voss, director of industrial relations, Republic Steel Corp., declared before the 15th annual convention of the National Association of Foremen here Oct. 15.

Frank J. Schaeffer, foreman of Republic's electric weld tube mill at Youngstown, was elected president of the association by the more than 2000 delegates.

Discussing fundamental differences between the American and British systems of labor relations, Mr. Voss pointed out that in the United States, written law is resorted to, which at best is frequently unsatisfactory because of the complexity of the subject which the law is designed to cover.

After pointing out that America is not half as widely unionized as Great Britain, Mr. Voss asserted the closed shop predominated in only a few industries there. He told how in Great Britain it is absolutely illegal for an employer to make deductions from a worker's pay except for the statutory deductions required by law for old age pensions and unemployment and health insurance. Minimum wages and maximum hours are not fixed by the government either directly or indirectly, except in sweated industries.

The foremen elected Art Horrocks of Akron as executive vice-president; Ed Seving, Sidney, Ohio, treasurer, and H. G. Evans, Akron, secretary.

NON-FERROUS

... Lifting of restrictions on copper output by foreign producers dampens the bullishness which accompanied two price rises in copper and one in zinc in the past week.

ANNOUNCEMENT by the foreign copper cartel that all restrictions on copper production were to be removed produced a dampening effect on all non-ferrous markets and wiped out much of the bullishness that permeated the markets early in the past week, during which time prices on copper and zinc were revised upward. The depressing effect of this announcement was evident in all the foreign markets this morning. On first

call this morning in London zinc was off two points and lead seven. The foreign basis on copper trading was around 11.15c., as compared with 11.50c. on the preceding day. The advances in domestic copper quotations of $\frac{1}{8}$ c. on Thursday and $\frac{1}{4}$ c. on Saturday, brings the Connecticut Valley price up to 11.25c. per lb., the highest since Nov. 22, 1937. The increase of \$2 a ton in spelter prices raises the East St. Louis base to 5.05c. a lb., the highest since Feb. 7.

With the exception of the tin market, where dull conditions still prevail, domestic sales were in good volume all week. Red metal bookings were close to 25,000 tons for the week, while spelter sales were 9000 and lead sales topped the 14,000 ton mark. The purchasing of supplies to support the general European armament race is

still the mainstay of the export copper market. The heavy volume of this type of buying tends to hide the fact that domestic buying, while at present accounting for only moderate tonnages, is steadily improving. Lead demand in the past week was mostly for November delivery, with practically every type of consumer in the market, while the brass makers accounted for the bulk of the week's spelter business.

Tin prices ended the week with a net gain of $\frac{3}{8}$ c. over the price of a week ago, despite the setback on Monday induced by the soft stock market on that day. Market sentiment today pointed to a resumption of the upward trend, in spite of the very light volume of business.

NON-FERROUS PRICES

Cents per lb. for early delivery

	Oct. 13	Oct. 14	Oct. 15	Oct. 17	Oct. 18
Electro. copper ¹	11.00	11.25	11.25	11.25	11.25
Lake copper	11.125	11.375	11.375	11.375	11.375
Straits tin, New York	45.20	45.50	45.00	45.25
Zinc, East St. Louis ²	5.05	5.05	5.05	5.05	5.05
Lead, St. Louis ³	4.95	4.95	4.95	4.95	4.95

¹ Delivered Conn. Valley, deduct $\frac{1}{4}$ c. for New York delivery. ² Add 0.39c. for New York delivery. ³ Add 0.15c. for New York delivery.

Warehouse Prices

Base per lb., Delivered

New York Cleveland

Tin, Straits pig	45.875c.	49.25c.
Copper, lake	12.25c.	12.375c.
Copper, electro	11.50c.	12.375c.
Copper, castings	11.25c.	11.875c.
*Copper sheets, hot-rolled	19.375c.	19.375c.
*High brass sheets	17.50c.	17.50c.
*Seamless brass tubes ..	20.25c.	20.25c.
*Seamless copper tubes ..	19.875c.	19.875c.
*Brass rods	13.375c.	13.375c.
Zinc slabs	6.50c.	7.50c.
Zinc sheets, No. 9 casks ..	10.50c.	12.10c.
Lead, American pig....	5.875c.	5.60c.
Lead, bar	6.625c.	8.75c.
Lead sheets, cut	8.25c.	8.25c.
Antimony, Asiatic	15.00c.	17.75c.
Alum., virgin, 99 per cent plus	22.50c.	
Alum., No. 1 remelt, 98 to 99 per cent	19.50c.	
Solder, $\frac{1}{2}$ and $\frac{1}{2}$	29.25c.	29.50c.
Babbitt metal, commercial grade	20.25c.	22.25c.

* These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33 $\frac{1}{3}$; on brass sheets and rods, 40, and on brass and copper tubes, 25.

Old Metals Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible..	8.75c.	9.50c.
Copper, hvy. and wire	7.75c.	8.25c.
Copper, light and bottoms	7.00c.	7.25c.
Brass, heavy	4.625c.	5.125c.
Brass, light	3.625c.	4.375c.
Hvy. machine composition	7.25c.	8.75c.
No. 1 yel. brass turnings	4.50c.	5.00c.
No. 1 red brass or compos. turnings	6.625c.	7.25c.
Lead, heavy	4.125c.	5.00c.
Cast aluminum	7.00c.	8.25c.
Sheet aluminum	11.25c.	12.75c.
Zinc	2.50c.	3.75c.

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered; virgin 99 per cent plus, 20c.-21c. a lb.; No. 12 remelt, No. 2 standard, 19c.-19.50c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt, New York; Asiatic, 14c. a lb. f.o.b.; American, 12.00c. a lb. QUICK-SILVER, \$76-\$78 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 11.625c. a lb. lcl.

Porcelain Enamel Forum Sets Record

ATENDANCE exceeding that of any previous meeting discussing problems of porcelain enamel industry was attained last week at the third annual Porcelain Enamel Institute Forum at the University of Illinois.

In a review of the industry for the past two years, Emerson Poste, consulting engineer, Chattanooga, Tenn., pointed out that porcelain enamel plants had operated above the general industrial average, some new equipment had been installed and new plants built. The most pronounced development trend, according to Mr. Poste, is the increasing use of acid resisting enamels and unit construction of refrigerators and stoves. A bright spot is the rapid expansion of the architectural field.

First Continuous Mill Anniversary Celebrated

ASHLAND, KY.—Schools, stores, and industrial plants were to close Wednesday, Oct. 19, when Ashland, Catlettsburg and neighboring Kentucky and Ohio communities celebrated the fifteenth anniversary of the world's first continuous sheet mill, built here in 1923 by the American Rolling Mill Co. Scheduled to speak were Gov. A. B. Chandler, George M. Verity, chairman, Calvin Verity, general manager, and Charles R. Hook, president, American Rolling Mill Co., and W. C. Hull, vice-president, and C. S. Lake, assistant to president of the C. & O. Railway.

FABRICATED STEEL

NORTH ATLANTIC STATES

AWARDS

- 710 Tons, Cheektowaga, N. Y., Spencer Lens building, to R. S. McMannus Steel Construction Co., Buffalo, through Gilmore, Carmichael & Olson, Cleveland.
- 700 Tons, Buffalo, Lakeview housing project, to Bethlehem Steel Co., Bethlehem, Pa.
- 700 Tons, Washington, Calvin Coolidge High School, to Fort Pitt Bridge Works Co., Pittsburgh.
- 600 Tons, Chicopee Falls, Mass., bridge, to Bethlehem Steel Co., Bethlehem, Pa.; T. Stewart & Sons Co., general contractor.
- 400 Tons, Pittsburgh, reconstruction, Herr's Island Bridge, to American Bridge Co., Pittsburgh; Eichleay Engineering Co., general contractor.
- 300 Tons, New York, steel curbing, to Phoenix Bridge Co., Phoenixville, Pa.
- 200 Tons, New York, Norwegian building at World's Fair, to C. Fred Wolfe, through George A. Fuller Co., New York.
- 145 Tons, Chappaqua, N. Y., Horace Greeley School, to Levine Brothers Iron Works, Yonkers, N. Y.; Wintour J. Hachett, general contractor.
- 133 Tons, New York, Irish building at World's Fair, to Bethlehem Fabricators, Inc., Bethlehem, Pa.; Hegeman-Harris Co., general contractor.
- 100 Tons, Boston, Huntington Avenue subway extension, beams, angles, plates, etc., to Carnegie-Illinois Steel Corp., Boston.

THE SOUTH

- 275 Tons, Rutledge, Tex., bulkhead gate, Marshall Ford Dam, to Hansell-Elcock Co., Chicago.
- 135 Tons, Owensboro, Ky., Grocers Bakery, to Louisville Bridge & Iron Co., Louisville, Ky.

CENTRAL STATES

- 2400 Tons, Arkalon, Kan., Rock Island Railroad bridge over Cimarron River, to American Bridge Co., Pittsburgh.
- 1500 Tons, Flint, Mich., machine shop, etc., for Buick Motor Co., to Whitehead & Kales Co., Detroit.
- 650 Tons, Flint, Mich., covered bridge, Buick Motor Co., to Whitehead & Kales Co., Detroit.
- 480 Tons, Dover, Ohio, Wooster Avenue bridge, to Burger Iron Works, Akron, Ohio.
- 375 Tons, Detroit, grade separation, to Bethlehem Steel Co., Bethlehem, Pa.
- 350 Tons, Downsville, Wis., State bridge, to Wisconsin Bridge & Iron Co., Milwaukee.
- 350 Tons, Clark and Green Counties, Ohio, State bridge, to Bethlehem Steel Co., Bethlehem, Pa.; through Midland Construction Co., Columbus, Ohio.
- 320 Tons, Columbus, Ohio, Fifth Avenue bridge over Scioto River, to Bethlehem Steel Co., Bethlehem, Pa.; through Visintine & Co., Cincinnati, general contractor.
- 175 Tons, Chicago, Racine Avenue pumping station, to American Bridge Co., Pittsburgh; through James McHugh & Sons, Inc., Chicago.
- 115 Tons, Toledo, Ohio, parking deck for The Fifty Associates, to Art Iron & Wire Works, Inc., Toledo.
- 100 Tons, Wellington, Ohio, school, to Fort Pitt Bridge Works Co., Massillon, Ohio; through De Hammell Construction Co.

WESTERN STATES

- 144 Tons, Skamokawa West, Wash., highway bridge, to Pacific Car & Foundry Co., Seattle, through MacRae Brothers, Seattle, contractors.

- 120 Tons, Grace, Idaho, State bridge over Bear River, to American Bridge Co., Pittsburgh.

HAWAII

- 400 Tons, Port Allen, wharf and terminal improvements, to Honolulu Iron Works, Honolulu, through E. E. Black, Honolulu, contractor.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

- 2200 Tons, Philadelphia, municipal courthouse.
- 2000 Tons, New York, road repairs, Williamsburg bridge, Taylor-Fichter Construction Co., New York, low bidder.
- 2000 Tons, Coatesville, Pa., White Hill industrial school; John McShain Corp., Philadelphia, low on rebidding.
- 1200 Tons, Philadelphia, Allegheny Avenue grade crossing.
- 700 Tons, Long Island City, N. Y., apartment houses, New York Housing Authority.
- 700 Tons, Baltimore, addition, Monumental Life Insurance Co.
- 550 Tons, Farmington and Barkhamstead, Conn., State bridge over Farmington River.
- 465 Tons, Farmington, Me., Center bridge over Sandy River.
- 400 Tons, Allendale, N. J., Erie Railroad grade crossing elimination.
- 300 Tons, New York, reconstruction of State bridges in Bronx.
- 265 Tons, Bogota, N. J., railroad grade crossing elimination.
- 265 Tons, Hornell-Big Creek, N. Y., highway project R.C. 3998, Shore Bridge Corp., Rensselaer, N. Y., low bidder.
- 200 Tons, Camden, N. J., institutional building, Bethlehem Fabricators, Inc., Bethlehem, Pa., low bidder.
- 100 Tons, Windsor, Vt., high school.

SOUTH AND SOUTHWEST

- 1500 Tons, Rockport, Ky., State highway bridge.
- 1300 Tons, Grove, Okla., highway bridge, Grand River Dam Authority; bids Oct. 25.
- 115 Tons, Savannah, Ga., coal handling tower; Watson Machine Co., general contractor.

CENTRAL STATES

- 2200 Tons, Chicago, Austin Avenue subway, under Milwaukee Railroad tracks; bids Oct. 21 formerly reported as 1200 tons.
- 400 Tons, Cleveland, East Ninth Street bridge; National Engineering & Contracting Co., low bidder.
- 400 Tons, Toledo, Ohio, and Marcus Hook, Pa., cracking case supports, Sun Oil Co.
- 375 Tons, Terre Haute, Ind., Federal penitentiary.
- 300 Tons, Whiting, Ind., platforms, buildings, etc., Standard Oil Co.
- 250 Tons, Chicago, repairs to Dearborn Street bridge, bids Oct. 27.
- 244 Tons, State of Wisconsin, three bridges; bids taken Oct. 18.

- 215 Tons, Columbia County, Wis., overhead; bids Oct. 28.

- 125 Tons, Trenton, Mich., case structure building, E. B. Badger & Son Co.

WESTERN STATES

- 400 Tons, Mare Island, Cal., nine ammunition storehouses; Golden Gate Iron Works, San Francisco, low bidder.
- 362 Tons, Clark County, Wash., Lewis River highway bridge; bids Nov. 1.
- 190 Tons, Delta, Cal., tunnel supports for Central Valley project (Invitation 806); bids Nov. 14.
- 150 Tons, Everett, Wash., auditorium-gymnasium; bids open.
- 112 Tons, East Ely, Nev., overpass; bids Nov. 3.

FABRICATED PLATES

AWARDS

- 7680 Tons, Palos Verdes, Cal., welded steel pipe feeder of Colorado River Aqueduct, to Emaco Derrick & Equipment Co., Los Angeles.
- 1200 Tons, New York, caissons, Criminal Courts building, to Bethlehem Steel Co., Bethlehem, Pa.; previously reported as piling.
- 825 Tons, Oakland, Cal., lighthouse tenders, to Moore Dry Dock Co., Oakland.
- 500 Tons, Sacramento, Cal., pipe, to Western Pipe & Steel Co., San Francisco.
- 360 Tons, Boston, pipe line, St. Botolph Street and Huntington Avenue, to Walsh Holyoke Steam Boiler Co., Holyoke, Mass.
- 203 Tons, Dearborn, Mich., pipe for Ford Motor Co., to an unnamed bidder.
- 200 Tons, Covington, Ky., Kenton County Water Commission, elevated tank, to Pittsburgh-Des Moines Steel Co., Pittsburgh.
- 200 Tons, Cleveland, relocation of 42-in. steel pipe line, Main Street bridge, to Bethlehem Steel Co., Bethlehem, Pa.; through National Engineering Contracting Co.
- 150 Tons, Wickenburg, Ariz., elevated tank, to Allison Steel Mfg. Co., Phoenix, Ariz.
- 125 Tons, Danville, Ky., elevated tank, to W. E. Caldwell Co., Inc., Louisville, Ky.
- 120 Tons, Oregon, Ill., 850,000-gal. tank, to Chicago Bridge & Iron Works, Chicago.
- 115 Tons, Flint, Mich., steel pipe for water softening plant, to Biggs Boiler Works, Akron, Ohio.
- 110 Tons, Bonneville Dam, Ore., formed plates, to Lukens Steel Co., Coatesville, Pa.; S. Morgan Smith Co. general contractor.

NEW PROJECTS

- 1000 Tons, Sandusky, Ohio, 42-in. pipe line; Thatcher Brothers, Toledo, general contractors.

SHEET PILING

AWARDS

- 350 Tons, Pickaway County, Ohio, State highway bridge, to Bethlehem Steel Co., Bethlehem, Pa., through Lewis & Frisinger, Mount Vernon, Ohio.
- 178 Tons, Dover, Ohio, Tuscarawas County bridge, to Burger Iron Works, Akron, through Wendling Brothers, Dover.
- 172 Tons, Belmont County, Ohio, State highway bridge, to Bethlehem Steel Co., Bethlehem, Pa., through Rice Brothers, Belmont.

NEW PROJECTS

- 275 Tons, Seattle, Wash., port improvements; bids opened.
- 115 Tons, Cleveland, East Ninth Street bridge; National Engineering & Contracting Co., low bidder.

IRON AND STEEL SCRAP

... Sale at Pittsburgh brings heavy melting steel down 50c.—Composite price \$14.17.

ON a mill sale in the Pittsburgh district, the market prices there for No. 1 heavy melting steel have declined 50c. a ton. This has been reflected in THE IRON AGE scrap composite price, which is down 8c. to \$14.17 compared with \$14.25, which has been the average for the four preceding issues. At Chicago, the price has firmed up 25c.

Despite the gain in steel ingot production over recent weeks, the scrap market seems to have been affected, sentimentally at least, by the decline in sheet and strip prices.

Pittsburgh

A moderate sized tonnage of No. 1 heavy melting has been sold into consumption at \$14.50 a ton. Other points in the district, however, continue to pay more than this price. The market this week is softer to the extent of 50c. a ton on No. 1 heavy melting, making this grade quotable at \$14.50 to \$15. Unsettled conditions in the steel industry and less active buying in the past several weeks have been partly responsible for the leveling off.

Chicago

Heavy melting steel is now quoted at a flat \$13 because of brokers' inability to buy for less or sell for more. The next sale almost surely will be at \$13.50 but as yet there have been no indications of a sale of an important tonnage at this level. No railroad lists of any consequence have been seen for over a month. The Burlington list, which was recently withdrawn, is to come up again next week at which time it will be seen if offering prices have increased.

Philadelphia

Broker buying against old export orders in the neighborhood of \$14 for No. 1 melting steel and \$13 for No. 2 continues to be the main support of the present dull market. Export material is currently being collected for a boat expected later this week, which after picking up about 4500 tons here, will move to New York for additional tonnage before sailing for Europe, where the boat itself will be scrapped. In the absence of new domestic business, quotations on No. 1 heavy melting for domestic consumption are unchanged at \$14 to \$14.50.

Cleveland

Mill buying of scrap still remains in the future. The only reflection of better operations to date lies in the fact that quotations here are probably a little firmer at their nominal levels.

Youngstown

Unsettled steel prices have counterbalanced the optimism created by higher mill operations. No. 1 heavy melting steel remains quotable at \$14 to \$14.50 a ton and other grades are unchanged.

Buffalo

The scrap market is still hanging fire, although sales are expected almost daily. Some small lots have been moving at the present prices but as yet they have been of no consequence. Mixed borings and turnings and cast iron borings are now selling at \$7.50 to \$8. No. 1 heavy melting steel stays at \$14 to \$14.50.

St. Louis

An East Side mill bought 2500 tons of No. 2 heavy melting steel at 50c. less than its preceding purchase, which, together with lack of buying from other sources and a heavier movement of scrap to this center caused the market to weaken.

Cincinnati

Reported improvement of mill demand stimulated old materials optimism, but new business is still lacking. Prices are firmer with strong indication of an upward movement in the next few weeks.

Detroit

Closing of two major factory lists on Monday of this week gave observers a better chance to size up the condition of the Detroit scrap market. Although less than 9000 tons of scrap was involved in the transactions, several grades of material were offered and purchased at prices which, for the most part, indicated no change in price levels. Hydraulic compressed sheets, however, were off, as was new factory busheling. By Tuesday noon there had been an accompanying softening of sentiment on sheet clippings. Incidentally, it was learned that the district's principal consumer is buying tonnages of heavy melting steel classified as "select industrial." Dealers' buying prices on this item range between \$11 and \$11.50. Recently there has been no activity in the regular No. 1 and No. 2 heavy melting steels so published prices are nominal.

New York

Scrap prices in the New York area are unchanged from last week both as regards domestic and export business.

Boston

The export market continues fairly active, although shippers report material coming out slowly. The movement of ma-

terial for domestic consumption is hampered by an indifferent Pittsburgh market. Prices, both export and domestic, have not changed. Foundries are taking machinery cast a little more freely, although individual purchases as a rule are comparatively small. A barge load of turnings and textile cast left Providence, R. I., the past week, presumably for the Philadelphia district.

... CANADA ...

... Hamilton Company may install continuous mill.

TORONTO, Oct. 18.—Outlook for new business in the Canadian iron and steel markets is improving steadily and substantial contracts are pending. Steel Co. of Canada, Ltd., Hamilton, proposes to install a \$10,000,000 continuous strip mill, but so far no contracts have been awarded.

Hamilton Bridge Co. has received several new contracts recently, details of which are not available at this time. W. B. Champ, president, states.

The Canadian railroads now are working on equipment purchase plans and orders are expected to be placed before the end of the year. Total amount of the railroad contracts are expected to be at least as large as those awarded in the previous two years, when they amounted to around \$40,000,000 annually.

Agricultural implements are increasing in demand in the Canadian West. The automotive industry is getting ready for a record production year and mining operations are showing steady improvement, with corresponding betterment in machinery, tools, and steel sales.

Merchant pig iron movement is picking up steadily and shipments for the past week made a favorable gain over preceding weeks, due to the fact that Great Lakes' melters now are taking delivery of iron before the close of navigation.

Imports at Philadelphia

PHILADELPHIA.—The following imports were received at Philadelphia during the past week: 600 tons of ferromanganese from Czechoslovakia; 101 tons of pig iron from the Netherlands; 499 tons of manganese ore from Soviet Russia; 18 tons of structural shapes and 8 tons of steel bars from Belgium; 8 tons of steel bars, 32 tons of steel tubes and 34 tons of steel forgings from Sweden.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:	
No. 1 hvy. mtng. steel.	\$14.50 to \$15.00
Railroad hvy. mtng.	15.75 to 16.25
No. 2 hvy. mtng. steel	13.50 to 14.00
Scrap rails	16.50 to 17.00
Rails 3 ft. and under.	17.00 to 17.50
Comp. sheet steel	14.50 to 15.00
Hand bundled sheets.	13.50 to 14.00
Hvy. steel axle turn.	13.50 to 14.00
Machine shop turn.	9.50 to 10.00
Short shov. turn.	9.50 to 10.00
Mixed bor. & turn.	8.25 to 8.75
Cast iron borings.	8.25 to 8.75
Cast iron carwheels.	14.50 to 15.00
Hvy. breakable cast.	12.50 to 13.00
No. 1 cupola cast.	15.25 to 15.75
RRRf knuckles & cplrs.	16.50 to 17.00
Rail coil & leaf springs	16.50 to 17.00
Rolled steel wheels.	16.50 to 17.00
Low phos. billet crops.	17.50 to 18.00
Low phos. punchings.	16.00 to 16.50
Low phos. plate	15.50 to 16.00

PHILADELPHIA

Per gross ton delivered to consumer:	
No. 1 hvy. mtng. steel.	\$14.50 to \$15.00
No. 2 hvy. mtng. steel.	13.00 to 13.50
Hydraulic bund., new.	14.50 to 15.00
Hydraulic bund., old.	11.50 to 12.00
Steel rails for rolling.	17.00 to 17.50
Cast iron carwheels.	16.50 to 17.00
Hvy. breakable cast.	16.00 to 16.50
No. 1 cast	16.50 to 17.00
Stove plate (steel wks.)	13.00 to 13.50
Railroad malleable	15.50 to 16.00
Machine shop turn.	8.00 to 8.50
No. 1 blast furnace.	6.50 to 7.00
Cast borings	6.50 to 7.00
Heavy axle turnings.	10.00 to 10.50
No. 1 low phos. hvy.	16.50 to 17.00
Couplers & knuckles.	16.50 to 17.00
Rolled steel wheels	16.50 to 17.00
Steel axles	21.50 to 22.00
Shafting	19.50 to 20.00
No. 1 RR. wrought.	15.00 to 15.50
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire	11.00 to 11.50
Cast borings (chem.)	9.50 to 10.00

CHICAGO

Delivered to Chicago district consumers:

Per Gross Ton	
Hvy. mtng. steel	\$13.00
Auto. hvy. mtng. steel alloy free	\$11.00 to 11.50
No. 2 auto. steel.	10.50 to 11.00
Shoveling steel	12.50 to 13.00
Factory bundles	11.50 to 12.00
Dealers' bundles	11.00 to 11.50
Drop forge flashings.	10.50 to 11.00
No. 1 busheling	11.50 to 12.00
No. 2 busheling, old.	4.25 to 4.75
Rolled carwheels.	15.00 to 15.50
Railroad tires, cut.	15.50 to 16.00
Railroad leaf springs.	15.50 to 16.00
Steel coup. & knuckles	14.00 to 14.50
Axle turnings	11.50 to 12.00
Coil springs	16.00 to 16.50
Axle turn. (elec.)	12.00 to 12.50
Low phos. punchings.	15.50 to 16.00
and under	15.50 to 16.00
Cast iron borings	6.50 to 7.00
Short shov. turn.	6.50 to 7.00
Machine shop turn.	5.50 to 6.00
Rerolling rails	17.00 to 17.50
Steel rails under 3 ft.	15.50 to 16.00
Steel rails under 2 ft.	16.00 to 16.50
Angle bars, steel	15.00 to 15.50
Cast iron carwheels.	13.00 to 13.50
Railroad malleable	14.00 to 14.50
Agric. malleable	10.00 to 10.50

Per Net Ton

Iron car axles	18.00 to 18.50
Steel car axles	18.50 to 19.00
Locomotive tires	15.50 to 16.00
Pipes and flues	8.50 to 9.00
No. 1 machinery cast.	12.00 to 12.50
Clean auto. cast.	11.50 to 12.00
No. 1 railroad cast.	11.00 to 11.50
No. 1 agric. cast.	10.50 to 11.00
Stove plate	8.50 to 9.00
Grate bars	8.50 to 9.00
Brake shoes	9.50 to 10.00

YOUNGSTOWN

Per gross ton delivered to consumer:	
No. 1 hvy. mtng. steel.	\$14.00 to \$14.50
No. 2 hvy. mtng. steel.	13.00 to 13.50
Low phos. plate	14.50 to 15.00
No. 1 busheling	13.00 to 13.50
Hydraulic bundles	13.50 to 14.00
Machine shop turn.	9.50 to 10.00

CLEVELAND

Per gross ton delivered to consumer:	
No. 1 hvy. mtng. steel.	\$12.50 to \$13.00
No. 2 hvy. mtng. steel.	11.50 to 12.00
Comp. sheet steel	12.00 to 12.50
Light bund. stampings	9.00 to 9.50
Drop forge flashings.	10.00 to 10.50
Machine shop turn.	7.00 to 7.50
Short shov. turn.	7.50 to 8.00
No. 1 busheling	11.00 to 11.50
Steel axle turnings.	10.00 to 10.50
Low phos. billet and bloom crops	17.00 to 17.50
Cast iron borings	7.75 to 8.25
Mixed bor. & turn.	7.75 to 8.25
No. 2 busheling	7.75 to 8.25
No. 1 cast	16.50 to 17.00
Railroad grate bars	9.50 to 10.00
Stove plate	10.00 to 10.50
Rails under 3 ft.	18.50 to 19.00
Rails for rolling	17.00 to 17.50
Railroad malleable	15.00 to 15.50
Cast iron carwheels	14.00 to 14.50

BUFFALO

Per gross ton delivered to consumer:	
No. 1 hvy. mtng. steel.	\$14.00 to \$14.50
No. 2 hvy. mtng. steel.	12.00 to 12.50
Scrap rails	15.00 to 15.50
New hvy. bndled sheets	12.00 to 12.50
Old hydraul. bundles.	10.50 to 11.00
Drop forge flashings.	12.00 to 12.50
No. 1 busheling	12.00 to 12.50
Hvy. axle turnings.	10.50 to 11.00
Machine shop turn.	6.75 to 7.25
Knuckles & couplers.	16.50 to 17.00
Coil & leaf springs.	16.50 to 17.00
Rolled steel wheels.	16.00 to 16.50
Low phos. billet crops.	15.50 to 16.00
Shov. turnings	6.75 to 7.25
Mixed bor. & turn.	7.50 to 8.00
Cast iron borings	7.50 to 8.00
Steel car axles	16.50 to 17.00
No. 1 machinery cast.	15.50 to 16.00
No. 1 cupola cast.	14.50 to 15.00
Stove plate	13.00 to 13.50
Steel rails under 3 ft.	17.50 to 18.00
Cast iron carwheels.	13.50 to 14.00
Railroad malleable	14.50 to 15.00
Chemical borings	8.50 to 9.00

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting.	\$12.50 to \$13.00
No. 1 hvy. melting.	12.50 to 13.00
No. 2 hvy. melting.	11.50 to 12.00
No. 1 locomotive tires.	13.00 to 13.50
Misc. stand. sec. rails.	12.75 to 13.25
Railroad springs	14.00 to 15.00
Bundled sheets	8.00 to 8.50
No. 1 busheling	7.50 to 8.00
Cast. bor. & turn.	3.50 to 4.00
Machine shop turn.	4.00 to 4.50
Heavy turnings	9.00 to 9.50
Rails for rolling	16.50 to 17.00
Steel car axles	17.50 to 18.00
No. 1 RR. wrought.	10.75 to 11.25
No. 2 RR. wrought.	12.00 to 12.50
Steel rails under 3 ft.	15.50 to 16.00
Steel angle bars	13.50 to 14.00
Cast iron carwheels.	13.75 to 14.25
No. 1 machinery cast.	14.25 to 14.75
Railroad malleable	12.00 to 12.50
No. 1 railroad cast.	11.00 to 11.50
Stove plate	9.00 to 9.50
Grate bars	8.50 to 9.00
Brake shoes	9.75 to 10.25

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mtng. steel.	\$11.00 to \$11.50
No. 2 hvy. mtng. steel.	8.75 to 9.50
Scrap rails for mtng.	15.00 to 15.50
Loose sheet clippings.	6.50 to 7.00
Hydrau. bndled sheets	10.00 to 10.50
Cast iron borings	3.00 to 3.50
Machine shop turn.	4.25 to 4.75
No. 1 busheling	7.75 to 8.25
No. 2 busheling	2.50 to 3.00
Rails for rolling	17.00 to 17.50
No. 1 locomotive tires.	13.75 to 14.25
Short rails	17.50 to 18.00
Cast iron carwheels.	12.25 to 12.75
No. 1 machinery cast.	11.75 to 12.25
No. 1 railroad cast.	10.75 to 11.25
Burnt cast	6.75 to 7.25
Stove plate	6.75 to 7.25
Agricul. malleable	11.25 to 11.75
Railroad malleable	13.75 to 14.25
Mixed hvy. cast.	9.25 to 9.75

BIRMINGHAM

Per gross ton delivered to consumer:	
Hvy. melting steel.	\$12.50 to \$14.00
Scrap steel rails	14.50 to 15.00
Short shov. turnings.	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought.	10.00
Rails for rolling	16.00 to 16.50
No. 1 cast	14.50
Tramcar wheels	14.00

DETROIT

Dealers' buying prices per gross ton:	
No. 1 hvy. mtng. steel.	\$10.00 to \$10.50
No. 2 hvy. mtng. steel.	8.50 to 9.00
Borings and turnings.	5.50 to 6.00
Long turnings	5.50 to 6.00
Short shov. turnings.	6.50 to 7.00
No. 1 machinery cast.	11.50 to 12.00
Automotive cast	12.50 to 13.00
Hvy. breakable cast.	9.00 to 9.50
Hydraul. comp. sheets.	11.75 to 12.25
Stove plate	8.00 to 8.50
New factory bushel.	10.75 to 11.25
Old No. 2 busheling.	3.00 to 3.50
Sheet clippings	9.00 to 9.50
Flashings	9.00 to 9.50
Low phos. plate scrap	11.75 to 12.25

NEW YORK

Dealers' buying prices per gross ton on cars:	
No. 1 hvy. mtng. steel.	\$10.00 to \$10.50
No. 2 hvy. mtng. steel	8.50 to 9.00
Hvy. breakable cast.	12.00 to 12.50
No. 1 machinery cast.	12.00 to 12.50
No. 2 cast	9.50 to 10.00
Stove plate	9.00 to 9.50
Steel car axles	20.00 to 20.50
Shafting	15.00 to 15.50
No. 1 RR. wrought.	11.00 to 11.50
No. 1 wrought long.	9.50 to 10.00
Spec. iron & steel pipe	8.50 to 9.00
Rails for rolling	16.00 to 16.50
Clean steel turnings.	3.50 to 4.00
Cast borings*	3.00 to 3.50
No. 1 blast furnace.	3.00 to 3.50
Cast borings (chem.)	9.50 to 10.00
Unprepared yard scrap	5.00 to 5.50
Light iron	3.00 to 3.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast†	\$13.50 to \$14.00
No. 2 cast†	10.50 to 11.00

* \$1.50 less for truck loads.

† Northern N. J. prices are \$2 to \$2.50 higher

BOSTON

Dealers' buying prices per gross ton:	
No. 1 hvy. mtng. steel.	Nominal
Scrap rails	Nominal
No. 2 steel	Nominal
Breakable cast	\$10.75 to \$11.00
Machine shop turn.	3.38
Mixed bor. & turn.	2.00 to 2.25
Bun. skeleton long.	7.00 to 7.25
Shafting	10.25 to 10.50
Cast bor. chemical.	5.50 to 5.75
Per gross ton delivered consumers' yards:	
Textile cast	\$12.50 to \$14.50
No. 1 machine cast.	12.50 to 14.50

PACIFIC COAST

Per gross ton delivered to consumer:	
No. 1 hvy. mtng. steel.	\$12.50 to \$14.00
No. 2 hvy. mtng. steel.	11.50 to 13.00

CANADA

Dealers' buying prices at their yards, per gross ton:

Toronto Montreal	
No. 1 hvy. mtng. steel.	\$9.50 \$9.00
No. 2 hvy. mtng. steel.	8.00 7.50
Mixed dealers steel.	7.00 6.50
Scrap pipe	5.50 5.00
Steel turnings	4.50 4.00
Cast borings	3.50 3.00
Machinery cast	15.00 14.00
Dealers cast	13.00 12.00
Stove plate	11.00 10.50

EXPORT

Dealers' buying prices per gross ton:	
New York, truck lots, delivered, barges	
No. 1 hvy. mtng. steel.	\$11.00 to \$11.50
No. 2 hvy. mtng. steel.	9.50 to 10.00
No. 2 cast	10.00 to 11.00
Stove plate	9.00 to 10.00
Boston on cars at Army Base or Mystic Wharf	
No. 1 hvy. mtng. steel.	\$12.50 to \$13.00
No. 2 hvy. mtng. steel.	11.50 to 12.00
Rails (scrap)	12.50 to 13.00
Philadelphia, delivered alongside boats, Port Richmond	
No. 1 hvy. mtng. steel.	\$14.00
No. 2 hvy. mtng. steel.	13.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are \$2 higher. F.o.b. Duluth, billets only, \$2 higher.

Per Gross Ton

Rerolling\$34.00
Forging quality 40.00

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton

Open-hearth or besse-
mer\$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Per Lb.

Grooved, universal and
sheared1.90c.

Wire Rods

(No. 5 to 9/32 in.)

Per Gross Ton

Pittsburgh, Chicago or Cleve-
land\$43.00
Worcester, Mass. 45.00
Birmingham 43.00
San Francisco 52.00
Rods over 9/32 in. or 47/64 in., in-
clusive, \$5 a ton over base.

SOFT STEEL BARS

Base per Lb.

Pittsburgh, Chicago, Gary,
Cleveland, Buffalo and Birm-
ingham 2.25c.
Detroit, delivered 2.35c.
Duluth 2.35c.
Philadelphia delivered 2.57c.
New York 2.59c.
On cars dock Gulf ports..... 2.60c.
On cars dock Pacific ports ... 2.85c.

RAIL STEEL BARS

(For merchant trade)

Pittsburgh, Chicago, Gary,
Cleveland, Buffalo, Birming-
ham 2.10c.
On cars dock Tex. Gulf ports.. 2.45c.
On cars dock Pacific ports.. 2.70c.

BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by
distributors)

Pittsburgh, Chicago, Gary,
Birmingham, Buffalo, Cleve-
land, Youngstown or Spar-
rows Pt. 1.90c. to 2.05c.
Detroit, delivered 2.00c. to 2.15c.
On cars dock Tex. Gulf
ports 2.25c. to 2.40c.
On cars dock Pacific ports.... 2.50c.

RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by
distributors)

Pittsburgh, Chicago, Gary, Buf-
falo, Cleveland, Youngstown
or Birmingham 1.75c. to 1.90c.
Detroit, delivered 1.85c. to 2.00c.
On cars dock Tex. Gulf
ports 2.10c. to 2.25c.
On cars dock Pacific ports.... 2.35c.

Prices on reinforcing bars have
been subject to concessions of \$3 a
ton or more from above quotations.

IRON BARS

Chicago and Terre Haute 2.15c.
Pittsburgh (refined) 3.60c.

COLD FINISHED BARS AND SHAFTING*

Base per Lb.

Pittsburgh, Buffalo, Cleveland,
Chicago and Gary 2.70c.
Detroit 2.75c.

* In quantities of 10,000 to 19,999 lb.

PLATES

Base per Lb.

Pittsburgh, Chicago, Gary,
Birmingham, Sparrows Point,
Cleveland, Youngstown,
Coatesville, Claymont, Del. 2.10c.
*Philadelphia, del'd 2.15c.
*New York, del'd 2.29c.
On cars dock Gulf ports..... 2.45c.
On cars dock Pacific ports..... 2.60c.
Wrought iron plates, P't'g.... 3.80c.

*Eastern prices subject to oc-
casional concessions of \$2 a ton.

FLOOR PLATES

Pittsburgh or Chicago 3.35c.
New York, del'd 3.71c.
On cars dock Gulf ports 3.70c.
On cars dock Pacific ports.... 3.95c.

STRUCTURAL SHAPES

Base per Lb.

Pittsburgh, Chicago, Gary, Buf-
falo, Bethlehem or Birming-
ham 2.10c.
Philadelphia, del'd 2.215c.
New York, del'd 2.27c.
On cars dock Gulf ports 2.45c.
On cars dock Pacific ports.... 2.70c.

STEEL SHEET PILING

Base per Lb.

Pittsburgh, Chicago or Buffalo 2.40c.
On cars dock Gulf ports 2.85c.
On cars dock Pacific ports 2.90c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than
60 lb., per gross ton.....\$40.00
Angle bars, per 100 lb. 2.70

F.o.b. Basing Points

Light rails (from billets) per
gross ton\$40.00
Light rails (from rail steel) per
gross ton 39.00

Base per Lb.

Cut spikes 3.00c.
Screw spikes 4.55c.
Tie plates, steel 2.15c.
Tie plates, Pacific Coast ports. 2.25c.
Track bolts, to steam railroads 4.15c.
Track bolts, to jobbers, all sizes
(per 100 counts)..... 65-5

Basing points on light rails are Pittsburgh,
Chicago and Birmingham; on spikes and tie
plates, Pittsburgh, Chicago, Portsmouth, Ohio,
Weirton, W. Va., St. Louis, Kansas City,
Minneapolis, Colo., Birmingham and Pacific Coast
ports; on tie plates alone, Steelton, Pa.,
Buffalo; on spikes alone, Youngstown, Lebanon,
Pa., Richmond, Va.

SHEETS**

PRICES F.O.B. UNLESS OTHERWISE
NOTED

Hot Rolled

Base per Lb.

Pittsburgh, Gary, Birming-
ham, Buffalo, Sparrows Point,
Cleveland, Youngstown, Mid-
dletown or Chicago 1.85c.
Detroit, delivered 1.95c.
Philadelphia, delivered 2.02c.
Granite City 1.95c.
On cars dock Pacific ports.... 2.35c.
Wrought iron, Pittsburgh..... 4.25c.

Cold Rolled**

Pittsburgh, Gary, Buffalo,
Youngstown, Cleveland, Mid-
dletown or Chicago 2.90c.
Detroit, delivered 3.00c.
Granite City 3.00c.
Philadelphia, delivered 3.22c.
On cars dock Pacific ports.... 3.50c.

* Mill run sheets are 10c. per 100 lb. less than
base; and primes only, 25c. above base.

** The above are generally actual going prices,
subject to change without notice and are \$6 a
ton below published prices announced recently for
fourth quarter delivery.

Galvanized Sheets, 24 Gage

Pittsburgh, Chicago, Gary,
Sparrows Point, Buffalo,
Middletown, Youngstown or
Birmingham 3.30c.
Philadelphia, del'd 3.47c.
Granite City 3.40c.
On cars dock Pacific ports.... 3.80c.
Wrought iron, Pittsburgh..... 6.10c.

Electrical Sheets (F.o.b. Pittsburgh)

Base per Lb.

Field grade 3.20c.
Armature 3.55c.
Electrical 4.05c.
Special Motor 4.95c.
Special Dynamo 5.65c.
Transformer 6.15c.
Transformer Special 7.15c.
Transformer Extra Special... 7.65c.

Silicon Strip in coils—Sheet price plus sil-
icon sheet extra width extras plus 25c. per 100
lb. for coils. Pacific ports add 70c. a 100 lb.

Long Ternes*

No. 24 unassorted 8-lb. coating
f.o.b. Pittsburgh or Gary.... 3.65c.
F.o.b. cars dock Pacific ports. 3.35c.

Vitreous Enameling Stock, 20 Gage*

Pittsburgh, Chicago, Gary,
Youngstown, Middletown or
Cleveland 3.05c.
Detroit, del'd 3.15c.
Granite City 3.15c.
On cars dock Pacific ports.... 3.65c.

* The above are generally actual going prices on
long ternes and enameling stock, subject to change
without notice and are \$6 a ton below published
prices announced recently for fourth quarter de-
livery.

TIN MILL PRODUCTS

Black Plate

Pittsburgh, Chicago and Gary 3.15c.
Granite City 3.15c.
On cars dock Pacific ports,
boxed 4.10c.

NOTE: No. 29 gage is heaviest in which tin
mill black plate is sold, No. 28 and heavier tak-
ing sheet base. There are no gages which take
the above base prices as extras are applicable in
all cases.

Tin Plate

Per Base Box

Standard cokes, Pittsburgh, Chi-
cago and Gary\$5.35
Standard cokes, Granite City... 5.45

Special Coated Manufacturing Ternes

Per Base Box

Pittsburgh\$4.65
Gary 4.65
Granite City 4.75

Roofing Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)
8-lb. coating I.C.\$12.00
15-lb. coating I.C. 14.00
20-lb. coating I.C. 15.00
25-lb. coating I.C. 16.00
30-lb. coating I.C. 17.25
40-lb. coating I.C. 19.50

HOT ROLLED STRIP**

Prices F.o.b. Unless Otherwise Noted
(Widths up to 12 in.)

Base per Lb.

Pittsburgh, Chicago, Gary,
Cleveland, Middletown,
Youngstown or Birmingham 1.85c.
Detroit, delivered 1.95c.

Copperage Stock

Pittsburgh & Chicago 2.25c.

COLD ROLLED STRIP**

Base per Lb.

Pittsburgh, Youngstown or
Cleveland 2.65c.
Chicago 2.75c.
Detroit, delivered 2.75c.
Worcester 2.85c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip

Pittsburgh, Youngstown or
Cleveland 2.80c.
Detroit, delivered 2.90c.
Worcester 3.20c.

** The above are generally actual going prices
on hot and cold rolled strip and commodity strip,
subject to change without notice and are \$6 a ton
below published prices announced recently for
fourth quarter delivery.

COLD ROLLED SPRING STEEL

Pittsburgh

and

Cleveland Worcester

Carbon	0.26-0.50%	2.75c.	2.95c.
Carbon	.51-.75	4.30c.	4.50c.
Carbon	.76-1.00	6.15c.	6.35c.
Carbon	1.01 to 1.25	8.35c.	8.55c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh, Chicago, Cleveland and Birmingham)

To Manufacturing Trade

	Per Lb.
Bright wire	2.60c.
Galvanized wire, base	2.65c.*
Spring wire	3.20c.

*On galvanized wire to manufacturing trade, size and galvanizing extras are charged, the price Nos. 6 to 9 gage, inclusive, thus being 3.15c.

To the Trade

	Base per Keg
Standard wire nails	\$2.45
Coated nails	2.45
Cut nails, carloads	3.60

	Base per 100 Lb.
Annealed fence wire	\$2.95
Galvanized fence wire	3.35
Polished staples	3.15
Galvanized staples	3.40
Barbed wire, galvanized	3.20
Twisted barless wire	3.20
Woven wire fence, base column. 67	
Single loop bale ties, base col. 56	

Note: Birmingham base same on above items, except spring wire.

Add \$4 a ton for Mobile, Ala.; \$5 for New Orleans; \$6 for Lake Charles to above bases, except on galvanized and annealed merchant fence wire, which are \$1 a ton additional in each case.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills
F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld		Wrought Iron	
In.	Steel Black Galv.	In.	Black Galv.
1/4	56 36	1/4 & 3/8	+ 9 +30
1/2	59 43 1/2	1/2	24 6 1/2
3/4	63 54	3/4	30 13
1	66 58	1 & 1 1/4	34 19
1 to 3...	68 1/2 60 1/2	1 1/2	38 21 1/2
		2	37 1/2 21

Lap Weld	
2	61 52 1/2
2 1/2 & 3	64 55 1/2
3 1/2 to 6	66 57 1/2
7 & 8	65 55 1/2
9 & 10	64 1/2 55
11 & 12	63 1/2 54

Butt Weld, extra strong, plain ends		Lap Weld, extra strong, plain ends	
1/4	54 1/2 41 1/2	2	33 1/2 18 1/2
1/2 to 3/4	56 1/2 45 1/2	2 1/2 to 3	33 1/2 17 1/2
3/4	61 1/2 53 1/2	4	33 1/2 21
1	65 1/2 57 1/2	4 1/2 to 6	32 1/2 20
1 to 3...	67 60	9 to 12	28 1/2 15

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher, on all butt weld 3 in. and smaller.

Boiler Tubes

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall. (Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Seamless Cold Drawn	Hot Rolled	Lap Weld Hot Rolled
1 in. o.d. ... 13 B.W.G.	\$ 9.01	\$ 7.82
1 1/4 in. o.d. ... 13 B.W.G.	10.67	9.26
1 1/2 in. o.d. ... 13 B.W.G.	11.79	10.23	9.72
1 3/4 in. o.d. ... 13 B.W.G.	13.42	11.64	11.06
2 in. o.d. ... 13 B.W.G.	15.03	13.04	12.36
2 1/4 in. o.d. ... 13 B.W.G.	16.76	14.54	13.79
2 1/2 in. o.d. ... 13 B.W.G.	18.45	16.01	15.16
2 3/4 in. o.d. ... 13 B.W.G.	20.21	17.54	16.58
3 in. o.d. ... 13 B.W.G.	21.42	18.59	17.54
3 1/4 in. o.d. ... 13 B.W.G.	22.48	19.50	18.35
3 1/2 in. o.d. ... 11 B.W.G.	23.37	24.62	23.15
4 in. o.d. ... 10 B.W.G.	35.20	30.54	28.66
4 1/2 in. o.d. ... 10 B.W.G.	43.04	37.35	35.22
5 in. o.d. ... 9 B.W.G.	54.01	46.87	44.25
6 in. o.d. ... 7 B.W.G.	82.93	71.96	68.14

Extras for less carload quantities:

40,000 lb. or ft. or over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%

10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago	\$51.00
6-in. and larger, del'd New York	49.00
*6-in. and larger, Birmingham	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	52.00
F.o.b. dock, Seattle	52.00
4-in. f.o.b. dock, San Francisco or Los Angeles	55.00
F.o.b. dock, Seattle	52.00

Class "A" and gas pipe, \$3 extra 4-in. pipe is \$3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$42, Birmingham, and \$50 delivered Chicago and 4-in. pipe, \$45, Birmingham, and \$54 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine and carriage bolts:	
1/2 in. & 6 in. and smaller	65, 5 and 5*
Larger and longer up to	
1 in.	60, 10 and 5*
1 1/2 in. and larger	60, 5 and 5*
Lag bolts	60, 10 and 5
Plow bolts, Nos. 1, 2, 3	
and 7	65, 5 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex. blank or tapped:	
1/2 in. and smaller	65 and 5
9/16 in. to 1 in. inclusive	60, 5 and 5
1 1/2 in. and larger	60 and 5

* Less carload lots and less than full container quantity. Less carloads lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-fin. hexagon nuts U.S.S. S.A.E.	
1/4 to 7/16 in. incl.	65-10 70-5
1/2 to 9/16 in.	65-5 70
5/8 to 1-in. incl.	60-10 65
1 1/4 in. and larger	60-5 60-5

Beyond the above, an additional 10 per cent allowed for full container quantities.
Stove bolts in packages, nuts attached

Stove bolts in packages, with nuts separate

Stove bolts in bulk

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(1/2-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh, Cleveland	
Chicago, Birmingham	\$3.40

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 10

Cap and Set Screws

	Per Cent Off List
Milled hexagon head cap screws, 1 in. dia. and smaller	50 and 10
Milled square head set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread 1/4 in. and smaller	70 and 10
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	67 1/2 and 10
Upset set screws, cup and oval points	75 and 10
Milled studs	60 1/2 and 10

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs
F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, \$56.00 a gross ton.

Alloy Steel Bars

	F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base	2.80c.
Delivered, Detroit	2.90c.
S.A.E. Alloy	
Series	Differential
Numbers	per 100 Lb.
200 (1/2% Nickel)	\$0.35

2100 (1 1/2% Nickel)	0.75
2300 (3 1/2% Nickel)	1.56
2500 (5% Nickel)	\$2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.85
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel - molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
5100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel-vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.40c. base per lb. Delivered Detroit, 3.50c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel		No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes ..	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip ..	23.50c.	21.50c.
Cold-rolled strip ..	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome		No.
No.	No.	No.
410	430	442
Bars ..	18.50c.	19c.
Plates ..	21.50c.	22c.
Sheets ..	26.50c.	29c.
Hot strip 17c.	17.50c.	23c.
Cold stp. 22c.	22.50c.	28.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental BRITISH

Per Gross Ton f.o.b. United Kingdom Ports

Ferromanganese, ex-port	£14 Nominal
Tin plate, per base box	20s. 3d. to 21s. 6d.
Steel bars, open hearth	£11
Beams, open-hearth	£10 12s. 6d.
Channels, open-hearth	£10 17s. 6d.
Angles, open-hearth	£10 12s. 6d.
Black sheets, No. 24 gage ..	£13
Galvanized sheets, No. 24 gage	£15 5s.

CONTINENTAL

Per Gross Ton, Gold £, f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet bars	Nominal
Plate 1/4 in. and up	£5 7s.
Plate 3/16 in. and 5 mm.	£5 13s.
Sheets 1/4 in.	£5 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£5 15s.

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.....	\$22.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	\$22.00
Delivered Brooklyn	24.50
Delivered Newark or Jersey City	23.53
Delivered Philadelphia	22.84
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown*..	21.00
F.o.b. Buffalo	21.00
F.o.b. Detroit	21.00
Southern, delivered Cincinnati ..	21.06
Northern, delivered, Cincinnati ..	21.44
F.o.b. Duluth	21.50
F.o.b. Provo, Utah	19.00
Delivered, San Francisco, Los Angeles or Seattle.....	24.50
F.o.b. Birmingham*	17.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.....	\$22.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	21.50
F.o.b. Buffalo	20.00
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown..	20.50
Delivered Philadelphia	22.34
Delivered Canton, Ohio	21.89
Delivered Mansfield, Ohio	22.44
F.o.b. Birmingham	16.00

Bessemer

F.o.b. Buffalo	\$22.00
F.o.b. Everett, Mass.....	23.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	23.00
Delivered Newark or Jersey City	24.53
Erie, Pa., and Duluth	22.00
F.o.b. Neville Island, Toledo, Chicago and Youngstown....	21.50
F.o.b. Birmingham	22.00
Delivered Cincinnati	22.11
Delivered Canton, Ohio	22.89
Delivered Mansfield, Ohio	23.44

Low Phosphorus

Basing points: Birdsboro, Pa. Steelton, Pa., and Standish, N. Y.	\$25.50 to \$26.50
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Gray Forge

Valley or Pittsburgh furnace...	\$20.50
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Charcoal

Lake Superior furnace	\$25.00
Delivered Chicago	28.34

Canadian Pig Iron

Per Gross Ton

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75.....	\$26.50
No. 2 fdy., sil. 1.75 to 2.25.....	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75.....	\$27.50
No. 2 fdy., sil. 1.75 to 2.25.....	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload).....	\$92.50
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Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%.....	\$28.00
Domestic, 26 to 28%.....	33.00

Electric Ferrosilicon

Per Gross Ton Delivered;

Lump Size

50% (carload lots, bulk).....	\$69.50*
50% (ton lots in 50 gal. bbl.)..	80.50*
75% (carload lots, bulk).....	126.00*
75% (ton lots in 50 gal. bbl.)..	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50%.....	\$30.50
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For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2%, 1 per ton additional. Phosphorus 0.75% or over, \$1 per ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50%	\$24.50
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For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Ferrochrome

Per Lb. Contained Cr., Delivered

Carlots, Lump Size, on Contract

4 to 6% carbon.....	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-manganese

Per Gross Ton, Delivered, Lump

Size, Bulk, on Contract

3% carbon	\$92.75
2.50% carbon	97.75
2% carbon	102.75
1% carbon	112.75

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads, nominally

\$2.00

Ferrotungsten, lots of 500 lbs. nominally

2.05

Ferrotungsten, smaller lots, nominally

2.10

Ferrovanadium, contract, per lb. contained V., delivered

\$2.70 to \$2.90†

Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots. \$2.25†

Ferrocobaltitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract

\$142.50

Ferrocobaltitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract,

\$157.50

Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unit-

age, freight equalized with Rockdale, Tenn., per gross

\$58.50

Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn.,

24%, per gross ton, \$3 unit-

age, freight equalized with Nashville

\$75.00

Ferromolybdenum, per lb. Mo. f.o.b. furnace

95c.

Calcium molybdate, per lb. Mo. f.o.b. furnace

80c.

*Spot prices are \$5 per ton higher

†Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%....	\$5.25
Old range, non-Bessemer, 51.50% ..	5.10
Messabi, Bessemer, 51.50%.....	5.10
Messabi, non-Bessemer, 51.50%..	4.95
High phosphorus, 51.50%.....	4.85

Foreign Ore

C.A.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria.....	13c.
Iron, low phos., Swedish, average, 68½% iron	15c.
Iron, basic or foundry, Swedish, aver. 65% iron.....	13c.
Iron, basic or foundry, Russian, aver. 65% iron.....	Nominal
Man., Caucasian, washed 52%	35c.
Man., African, Indian, 44-48%	33c.
Man., African, Indian, 49-51%	35c.
Man., Brazilian, 46 to 48½%	33c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered	\$20.00
Tungsten, domestic, scheelite delivered	\$19.00 to \$20.00
Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	15.00
Rhodesian, 45%	19.50
Rhodesian, 48%	23.00
Turkish, 48-49%	23.50 to 24.50
Turkish, 45-46%	22.50
Turkish, 44%	18.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50%	24.50 to 25.50
48-49%	24.50 to 25.00

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	18.00
Domestic, f.o.b. Ohio River landing barges	18.00
No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines.....	19.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid....	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	31.50

FUEL OIL

Per Gal.

No. 2 or diesel, f.o.b. Bayonne.....	4.125c.
No. 6, f.o.b. Bayonne.....	2.26c.
Del'd Chicago, No. 5 Bur. Stds. 3.25c.	
Del'd Chicago, No. 6 Bur. Stds. 2.75c.	
Del'd Cleve'd, No. 3 distillate 5.50c.	
Del'd Cleve'd, No. 4 industrial 5.25c.	
Del'd Cleve'd, No. 5 industrial 3.00c.	
Del'd Cleve'd, No. 6 industrial 2.75c.	

COKE

Per Net Ton

Furnace, f.o.b. Connells-ville, Prompt	\$3.75
Foundry, f.o.b. Connells-ville, Prompt	\$4.75 to 5.50
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England....	12.50
Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.95
Foundry, by-product, delivered Cleveland ..	10.30
Foundry, by-product, delivered Cincinnati ..	9.75
Foundry, Birmingham ..	7.50
Foundry, by-product, del'd St. Louis industrial district	10.75 to 11.00
Foundry, from Birmingham, f.o.b. cars dock, Pacific ports	14.75

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH

	Base per Lb.
Plates	3.55c.
Shapes	3.55c.
Soft steel bars and small shapes	3.60c.
**Reinforcing steel bars	2.70c.
Cold finished bars and screw stock	3.95c.
Hot rolled strip	3.75c.
Hot rolled sheets	3.50c.
Galv. sheets (24 ga.) 500 lb. to 1499 lb.	4.50c.
Wire, black, soft annealed	3.15c.
Wire, galv. soft	3.55c.
Track spikes (1 to 24 kegs)	3.75c.
Wire nails (in 100-lb. kegs)	2.65c.

On plates, structurals, bars, strip and hot rolled sheets, base applied to orders of 400 to 1999 lb. ** On reinforcing bars base applies to orders of less than one ton and includes switching and carting charge. All above prices for delivery within the Pittsburgh switching district.

NEW YORK

	Base per Lb.
Plates, 1/4 in. and heavier	3.83c.
Structural shapes	3.75c.
Soft steel bars, round	3.94c.
Iron bars, Swed. charcoal	7.50 to 8.25c.
Cold-fin. shafting and screw stock:	
Rounds, squares, hexagons	4.39c.
Flats up to 12 in. wide	4.39c.
Cold-rolled strip, soft and quarter hard	3.66c.
Hot-rolled strip, soft O.H.	4.11c.
Hot-rolled sheets (10 ga.)	3.73c.
Galv. sheets (24 ga.)	4.60 to 4.85c.
Long ternes (24 ga.)	5.50 to 6.20c.
Cold-rolled sheets (20 ga.)	
Standard quality	4.90c.
Deep drawing	5.15c.
Stretchers leveled	5.50c.
SAE, 2300, hot-rolled	7.50c.
SAE, 3100, hot-rolled	6.10c.
SAE, 6100, hot-rolled annealed	10.25c.
SAE, 2300, cold-rolled	8.69c.
SAE, 3100, cold-rolled, annealed	7.29c.
Floor plate, 1/4 in. and heavier	5.43c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.65c.
Wire, galv. (No. 9)	5.00c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, per keg in 25 keg lots	\$3.25

CHICAGO

	Base per Lb.
Plates and structural shapes	3.55c.
Soft steel bars, rounds and angles	3.60c.
Soft steel squares, hexagons, channels and Tees	3.75c.
Hot rolled strip	3.75c.
Floor plates	5.15c.
Hot rolled sheets	3.50c.
Galvanized sheets	4.50c.
Cold rolled sheets	4.45c.
Cold finished carbon bars	4.05c.

Above prices are subject to deductions and extras for quantity and are f.o.b. consumer's plant within Chicago free delivery zone.

CLEVELAND

	Base per Lb.
Plates	3.55c.
Structural shapes	3.73c.
Soft steel bars	3.50c.
Reinfor. bars (under 2000 lb.)†	2.55c.
Cold-fin. bars (1000 lb. over)	4.05c.
Hot-rolled strip	3.65c.
Cold rolled sheets	4.70c.
Cold-finished strip	3.35c.
Galvanized sheets (No. 24)	4.62c.
Hot-rolled sheets	3.50c.
Floor plates, 3/16 in. and heavier	5.33c.
*Black ann'd wire, per 100 lb.	\$3.10
*No. 9 galv. wire, per 100 lb.	3.50
*Com. wire nails, base per keg	2.60
Hot rolled alloy steel (3100)	6.05c.
Cold rolled alloy steel (3115)	6.85c.

* For 5000 lb. or less
† 500 lb., base quantity.
Prices shown on hot rolled bars, strip, sheets, shapes and plates are for 400 to 1999 lb. Alloy steel, 1000 lb. and over; galvanized sheets, 150 to 1499 lb.; cold rolled sheets, 399 lb. and under.

ST. LOUIS

	Base per Lb.
Plates and structural shapes	3.82c.
Bars, soft steel (rounds and flats)	3.87c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	4.02c.
Cold fin. rounds, shafting, screw stock	4.32c.
Galv. sheets (24 ga.)	4.77c.
Hot rolled sheets	3.77c.
Galv. corrugated sheets, 24 ga. and heavier	4.82c.
Structural rivets	5.02c.

* No. 26 and lighter take special prices.

BOSTON

	Base per Lb.
Structural shapes, 3 in. and larger	5.85c.
Plates, 1/4 in. and heavier	3.85c.
Bars	3.98c.
Heavy hot rolled sheets	3.86c.
Hot rolled sheets	4.21c.
Hot rolled annealed sheets	4.76c.
Galvanized sheets	4.76c.
Cold rolled sheets	4.93c.

The following quantity differentials apply: Less than 100 lb., plus \$1.50 per 100 lb.; 100 to 399 lb., plus 50c.; 400 to 1999 lb. base; 2000 to 9999 lb. minus 20c.; 10,000 to 39,999 lb. minus 30c.; 40,000 lb. and over minus 40c.

BUFFALO

	Base per Lb.
Plates	3.77c.
Floor plates	5.40c.
Struc. shapes	3.55c.
Soft steel bars	3.60c.
Reinforcing bars (20,000 lb. or more)	2.05c.
Cold-fin. flats, squares, rounds, and hex.	4.05c.
Hot-rolled sheets, 3/16 x 14 in. to 48 in. wide incl. also sizes No. 8 to 30 ga.	3.50c.
Galv. sheets (24 ga.)	4.50c.
Bands and hoops	3.97c.

NEW ORLEANS

	Base per Lb.
Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	3.55
Bolts and nuts, per cent off list	60

REFRACTORIES PRICES

	Per 1000 f.o.b. Works
Fire Clay Brick	
Super-duty brick, at St. Louis	\$60.80
First quality Pennsylvania, Maryland, Kentucky, Missouri and Illinois	47.50
First quality, New Jersey	52.50
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	42.75
Second quality, New Jersey	49.00
No. 1, Ohio	39.90
Ground fire clay, per ton	7.10

	Per 1000 f.o.b. Works
Silica Brick	
Pennsylvania	\$47.50
Chicago District	56.05
Birmingham	47.50
Silica cement per net ton (Eastern)	8.55

	Per Net Ton
Chrome Brick	
Standard f.o.b. Baltimore, Plymouth Meeting and Chester	\$47.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	47.00

	Per Net Ton
Magnesite Brick	
Standard f.o.b. Baltimore and Chester	\$67.00
Chemically bonded, f.o.b. Baltimore	57.00

	Per Net Ton
Grain Magnesite	
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	\$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	40.00
Domestic, f.o.b. Chewelah Wash. (in bulk)	22.90

PHILADELPHIA

	Base per Lb.
*Plates, 1/4-in. and heavier	3.40c.
*Structural shapes	3.40c.
*Soft steel bars, small shapes, iron bars (except bands)	3.60c.
†Reinforc. steel bars, square and deformed	2.61c.
Cold-finished steel bars	4.36c.
*Steel hoops	4.10c.
*Steel bands, No. 12 and 3/16 in. incl.	3.60c.
*Spring steel	4.75c.
†Hot-rolled anneal. sheets	3.40c.
†Galvanized sheets (No. 24)	4.50c.
*Diam. pat. floor plates, 1/4 in.	5.00c.

These prices are for delivery in Philadelphia trucking area. *Base prices subject to deduction on orders aggregating 4000 lb. or over. †For 25 bundles or over. ‡For one to five tons.

BIRMINGHAM

Bars and bar shapes	\$3.85 base	
Structural shapes and plates	3.75 "	
Hot rolled sheets No. 10 ga.	3.80 "	
Hot rolled sheets No. 24 ga.	4.40 "	3500 lb. and over
Galvanized sheets No. 24 ga.	5.05 "	3500 lb. or more
Strip	4.05 "	
Reinforcing bars	3.85 "	
Floor plates	5.96 "	
Cold finished bars	4.91 "	
Machine and carriage bolts	.50 & 10 off list	
Rivets (structural)	\$4.60 base	
On plates, shapes, bars, hot-rolled strip heavy hot-rolled sheets, the base applies on 400 to 3999 lb. All prices are f.o.b. consumer's plant.		

PACIFIC COAST

	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.85c.	4.00c.	4.05c.
Shapes, standard	3.95c.	4.00c.	4.05c.
Soft steel bars	4.05c.	4.00c.	4.30c.
Reinforcing bars, f.o.b. cars dock			
Pacific ports	2.675c. open.	2.975c.	
Hot-rolled sheets (No. 10)	3.80c.	4.20c.	4.20c.
Galv. sheets (No. 24 and lighter)	5.15c.	5.05c.	5.50c.
Galv. sheets (No. 22 and heavier)	5.40c.	5.05c.	5.50c.
Cold-finished steel			
Rounds	6.55c.	6.60c.	7.10c.
Squares and hexagons	7.80c.	7.85c.	7.10c.
Flats	8.30c.	8.35c.	8.10c.
Common wire nails—base per keg less carload	\$3.20	\$3.05	\$3.00

All items subject to differentials for quantity.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.83c.
Hot-rolled annealed sheets, No. 24	4.75c.
Galvanized sheets, No. 24	5.00c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

Commanding Officer, Ordnance Department, Watervliet Arsenal, Watervliet, N. Y., asks bids until Nov. 7 for one light-type universal milling machine (Circular 47).

National Biscuit Co., 449 West 14th Street, New York, has leased recently completed one-story industrial building, 100 x 160 ft., at Broadway and Halleck Avenue, Jersey City, N. J., and will equip for new branch storage and distributing plant.

Board of Education, East Greenbush, N. Y., plans manual training department in new three-story and basement central school, for which a bond issue of \$1,336,000 has been authorized. Bids will be asked soon on general contract. J. R. White, 109 State Street, Albany, N. Y., is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 1 for motor-driven radial drills and spare parts (Schedule 4664) for Brooklyn and Philadelphia Navy Yards; for quantity of power distribution panels and circuit breakers (Schedule 4658) for Brooklyn yard.

F. & M. Schaefer Brewing Co., 430 Kent Avenue, Brooklyn, has let general contract to Turner Construction Co., 420 Lexington Avenue, New York, for remodeling and improving three-story motor truck service, repair and garage building at 1-5 South Eleventh Street, Brooklyn, for company trucks and cars. Cost about \$170,000 with equipment. Eggers & Higgins, 542 Fifth Avenue, New York, are architects.

Purchasing and Contracting Officer, Quartermaster Corps, Fort Slocum, N. Y., asks bids until Nov. 5 for one down-draft, firebox steel boiler (Circular 842-12).

Board of City Commissioners, Camden, N. J., plans new pumping plant for municipal water system, using diesel engine-driven pumping units and accessory equipment. Cost about \$385,000. Financing is being arranged through Federal aid. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Commanding Officer, Ordnance Department, Picatinny Arsenal, near Dover, N. J., asks bids until Oct. 28 for 10,000 galvanized steel containers for smokeless powder (Circular 302).

Board of Directors, Middlesex County Vocational Schools, Easton Avenue, New Brunswick, N. J., will begin superstructure soon for new one-story and basement vocational school, for which general contract recently was let to Frank Briscoe Co., 287 South 19th Street, Newark, N. J. Cost close to \$200,000 with equipment. Financing has been arranged through Federal aid. Alexander Merchant & Son, 1 Elm Row, New Brunswick, are architects. Saul Shaw & Co., 24 Walnut Street, Newark, are engineers.

Signal Corps Procurement District, Army Base, 58th Street and First Avenue, Brooklyn, asks bids until Oct. 24 for quantity of junction boxes (Circular 65); until Oct. 26 for quantity of plugs (Circular 68); until Nov. 8 for 15,000 flashlights, 750 lens assemblies, 600 lamp-holders and 300 reflectors (Circular 67).

Board of Public Education, Administration Building, Parkway and 21st St., Philadelphia, A. B. Anderson, secretary and business manager, asks bids until Oct. 31 for quantity of metal sash, metal seat fittings, chain link fence and other school equipment.

General State Authority, 112 North Second Street, Harrisburg, Pa., A. S. Janeway, executive director, asks bids until Oct. 25 for shop buildings, power plant and engine house at new state prison at Mount Gretna, Pa., in conjunction with other buildings and utilities. Fund of about \$3,000,000 has been arranged for project. Hornbostel & Lappley, Riverview Manor, Harrisburg, are architects.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids un-

til Oct. 24 for one radial drill (Circular 344), 200 radial ball bearings (Circular 343); until Oct. 28 for exhaust equipment (Circular 353).

◀ BUFFALO DISTRICT ▶

Union Fork & Hoe Co., Frankfort, N. Y., has acquired tract of land adjoining works at Frankfort and plans new additions. Cost over \$300,000 with equipment.

Holley Canning Co., Holley, N. Y., food products, plans rebuilding of portion of plant recently destroyed by fire. Loss close to \$40,000 with equipment.

New York Electric & Gas Corp., Ithaca, N. Y., plans extensions in power lines in group of 24 counties, totaling about 416 miles, with service and operating facilities. Fund of \$500,000 has been arranged through Federal aid for project.

◀ NEW ENGLAND ▶

Louis Werner Auto Parts, Inc., 318 Crown Street, New Haven, Conn., manufacturer of automobile parts and equipment, plans one-story and basement addition, 38 x 100 ft., on adjoining site, now occupied by a three-story building, to be razed soon. Cost over \$45,000 with equipment. Charles H. Abramowitz, New Haven, is architect.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until Oct. 28 for four automatic milling machines (Circular 85), one plain bench lathe (Circular 90), one universal tool and cutter grinder, with form tool grinding attachment (Circular 94), one semi-automatic multi-tool turning lathe (Circular 96); until Nov. 4 for two motor-driven, geared-head 12-in. lathes (Circular 97), one horizontal hydraulic broaching machine (Circular 98).

Naval Affairs Commission, Navy Department, Washington, plans new two-story and basement school, 80 x 150 ft., at naval training submarine base, New London, Conn. Fund of \$212,000 has been arranged for building and equipment. Schofield & Deimel, Mercer Building, New London, Conn., are architects.

Commanding Officer, Ordnance Department, Watertown Arsenal, Watertown, Mass., asks bids until Oct. 26 for one high-frequency coreless induction furnace for melting steel (Circular 182).

◀ WASHINGTON DIST. ▶

Quartermaster Depot, War Department, Washington, asks bids until Nov. 3 for large quantities of steel clothes lockers, various deliveries (Circular 950-67).

Chemical Warfare Service, Edgewood Arsenal, Edgewood, Md., asks bids until Oct. 24 for quantity of mill files, round files, cut files and pillar files (Circular 128).

Bennett Foods Co., 2700 Sisson Street, Baltimore, food products, has asked bids on general contract for new one and two-story plant on Haven Street. Cost over \$45,000 with equipment. Alexander G. Porter, 1010 North Charles Street, is architect.

General Purchasing Officer, Panama Canal, Washington, asks bids until Oct. 31 for 25,000 ft. of copper wire, 15,000 ft. of telephone cable, one combination saw, one rip saw, one machine stand, pinions for shipper shaft on drifter dredge, bronze propellers, one set of planer control equipment, quantity of twist drills, files, machinist's bench vises, ratchet braces, pipe wrenches, hand shovels, 14,400 hacksaw blades, 800 lbs. manganese bronze welding rods and other equipment (Schedule 3391).

John Deere Plow Co., 211 West Pratt Street, Baltimore, has asked bids on general contract for one-story factory branch, storage and distributing plant at Exeter Hall and Kirk Avenues, Baltimore. Cost close to \$50,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 25 for one motor-driven, combination contour metal sawing, filing and polishing machine (Schedule 4607), one motor-driven automatic thread grinder machine and attachments (Schedule 4597), one motor-driven universal grinder machine (Schedule 4605), six motor-driven combination wet and dry grinders (Schedule 4601), one motor-driven woodworking surface planer (Schedule 4598), one motor-driven, universal, cutting-type, horizontal hobbing and spline machine (Schedule 4602), two motor-driven precision jig boring machines and equipment (Schedule 4604), two motor-driven turret lathes (Schedule 4613), one motor-driven jig boring machine (Schedule 4609) for Washington yard; until Oct. 28 for two motor-driven horizontal boring, drilling and milling machines (Schedule 4614) for Portsmouth, N. H., yard.

◀ SOUTH ATLANTIC ▶

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Nov. 2 for crane runways for Navy Yard at Charleston, S. C. (Specifications 8846).

City Council, Abbeville, S. C., plans municipal hydroelectric power plant, including power dam, generating station with 1500 and 500-kw. hydraulic turbine-generator units and accessories, power substation, transmission and distributing lines. Fund of \$435,000 has been secured through Federal aid. Work scheduled to begin soon.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 28 for quantity of spare parts for airplanes (Schedule 900-2130) for Pensacola, Fla., naval air station.

◀ SOUTHWEST ▶

Security Stove & Mfg. Co., 1630 Oakland Street, Kansas City, Mo., manufacturer of stoves, ranges, parts, etc., has filed plans for two-story addition, 86 x 125 ft. Cost close to \$50,000 with equipment.

State Building Commission, Bi-Partisan Advisory Board, Merchants' Bank Building, Jefferson City, Mo., Edgar M. Eagan, executive secretary, asks bids until Oct. 28 for equipment for power plants at different institutions as follows: Engine-generator unit and accessories, Nevada, Mo., Black & Veatch, 4706 Broadway, Kansas City, Mo., consulting engineers; steel water tank and elevated steel tower, Farmington, Mo., H. H. Morrison and Joseph A. Osborn, Fullerton Building, St. Louis, associated engineers; coal and ash-handling equipment, and walkways, gratings, railings and stairs, Mount Vernon, Mo., Baumes-McDevitt Co., Railway Exchange Building, St. Louis, consulting engineer; boiler plant instruments and combustion control equipment, Fulton, Nevada, Marshall, Farmington, Mount Vernon and Jefferson City, Mo., Charles A. Haskins, Finance Building, Kansas City, Mo., consulting engineer and general supervising engineer for all other work noted.

Monsanto Chemical Co., 1700 South Second Street, St. Louis, has let general contract to Fruin-Colnon Contracting Co., Merchants' Laclede Building, for one-story addition to main plant at Monsanto, Ill., for storage and distribution in phosphate division. Cost close to \$90,000 with equipment.

City Council, Baird, Tex., plans new municipal electric power plant. Cost about \$224,000, of which \$150,000 will represent a bond issue, recently approved, and remainder through Federal aid. Albert C. Moore & Co., Weatherford, Tex., are consulting engineers.

Continental Supply Co., Continental Building, Dallas, Tex., oil well equipment and supplies, steel pipe, etc., has asked bids on general contract for one and two-story plant, 60 x 390 ft., with two one-story wing extensions, each 25 x 140 ft., at Navigation Boulevard and Industrial Way, Houston, Tex. Cost about \$250,000 with equipment. Other units are scheduled at later date. Company is a subsidiary of Youngstown Sheet & Tube Co., Youngstown, Ohio. Harry Weaver is company engineer. S. Q. Bates will be in charge of new plant.

◀ SOUTH CENTRAL ▶

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until Oct. 31 for one 300-kva., direct-connected, gasoline engine-driven electric generator unit, complete with accessory equipment, for Guntersville, Ala., power station.

Alabama Power Co., Birmingham, plans extensions and improvements in transmission and distributing lines in Southeastern part of State, including new high-tension lines at Eufaula, Dothan and vicinity. Cost over \$400,000 with service substations and operating facilities. Company also is arranging fund of about \$1,500,000 through Federal aid for extensions in rural electric lines in group of 15 counties, with service facilities.

Grocers' Baking Co., 1455 South Seventh Street, Louisville, has asked bids on general contract for new one-story and basement baking plant, 100 x 230 ft., at Owensboro, Ky., with traveling ovens, conveyors, mixers and other mechanical equipment. Cost over \$80,000. Arthur G. Tafel, 140 South Third Street, is architect, and Warren & Ronald, Heyburn Building, mechanical engineers, both of Louisville.

◀ OHIO AND INDIANA ▶

Board of Education, 216 East Ninth Street, Cincinnati, Frank W. Willey, chairman, has concluded arrangements for financing through Federal aid for new multi-story vocational high school and will have plans drawn at once. Cost about \$900,000 with equipment. Hake & Hake, 2400 Gilbert Avenue, are architects.

Toledo Edison Co., Toledo, Ohio, will replace damage to steam-electric generating plant on Water Street, recently caused by explosion. Loss over \$60,000 including equipment.

Procter & Gamble Co., Gwynne Building, Cincinnati, has let general contract to Consolidated Engineering Co., 20 East Franklin Street, Baltimore, for new two-story factory branch, storage and distributing plant at 1333 Marriott Street, Baltimore, 89 x 254 ft. Cost over \$70,000 with equipment.

City Council, Piqua, Ohio, has plans maturing for extensions and improvements in municipal electric power plant, including installation of additional equipment. Cost about \$450,000, of which part will be a Federal grant, recently secured. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Contracting Officer, Materiel Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Oct. 26 for radiator assemblies (Circular 229).

Gus Juengling & Son, 2869 Massachusetts Avenue, Cincinnati, meat packers, plan one and two-story addition, 33 x 63 ft. Cost over \$45,000 with equipment. Wilkens & Gross, 1107 Bates Avenue, are architects and engineers.

Board of Trustees, State School for Deaf, 1050 East 46th Street, Indianapolis, will take bids soon for extensions and improvements in power house at institution, including installation of two 300-hp. watertube boiler units and accessories, chain grate stokers, feed water heaters, combustion control equipment, soot blowers, ash-handling equipment, water softener and miscellaneous equipment. Bevington-Williams, Inc., Indiana Pythian Building, is consulting engineer.

Contracting Officer, Quartermaster Corps, Jeffersonville, Ind., asks bids until Oct. 26 for one motor-driven portable belt ash conveyor (Circular 431-62).

◀ MICHIGAN DISTRICT ▶

Filtex Corp., Jackson, Mich., formerly known as Dustex Corp., has leased space in local Acme Industries building and will operate plant at that location for production of a cylinder-type vacuum cleaner and air purifier for automotive service. Proposed to have plant ready for production in November.

City Council, Sturgis, Mich., plans expansion and improvements in municipal electric power plant, including installation of additional equipment. Cost about \$274,000. Financing

has been arranged through Federal aid. Work is scheduled to begin soon.

Schwinger & Sons, Saginaw, Mich., food packers, plan rebuilding of portion of plant on Vassar Road, about five miles from city, recently destroyed by fire. Loss close to \$40,000 with equipment.

City Council, Saginaw, Mich., plans new municipal electric power plant and electrical distributing system. Cost about \$6,000,000. Financing is being arranged through Federal loan and grant. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

◀ MIDDLE WEST ▶

United States Gypsum Co., 300 West Adams Street, Chicago, has let general contract to George A. Fuller Co., New York, for new plant on Trout River, Jacksonville, Fla. It will comprise several one and multi-story units, with power house, machine shop and auxiliary structures, equipped for production of gypsum building products, wallboard, etc. An award for dock on waterfront, to be equipped for mechanical-handling of raw materials, has been let to George D. Auchter Co., Jacksonville. Entire project will cost about \$1,000,000.

American Manganese Steel Co., 332 South Michigan Avenue, Chicago, has let general contract to J. W. Snyder Co., 307 North Michigan Avenue, for one-story addition to mill at Chicago Heights. Cost close to \$100,000 with equipment. Benjamin F. Olson, 19 South LaSalle Street, is architect.

Cedar Rapids Irrigation and Power District, Cedar Rapids, Neb., H. C. James, consulting engineer, plans hydroelectric power development in Boone County, where site is being secured, including power dam, generating station, transmission and distributing lines, and other operating structures. Cost about \$1,500,000. Financing is being arranged through Federal aid.

Northwest Refining Co., Cut Bank, Mont., plans addition to oil refining plant, with installation of equipment to increase crude oil-handling capacity from 2500 to 3000 bbl. per day. Also will increase steel storage tank division and other operating departments. Cost over \$80,000 with equipment. L. B. O'Neil is president.

S. E. Jerald Sulky Co., 315 Courtland Street, Waterloo, Iowa, manufacturer of wagons and parts, has approved plans for one-story and basement plant at 80 Webster Street, 58 x 100 ft. Cost close to \$40,000 with equipment.

Illinois Minerals Co., Murphysboro, Ill., is considering rebuilding of portion of silica sand mining and refining plant recently destroyed by fire. Loss about \$75,000 with equipment.

City Council, David City, Neb., plans new municipal electric power plant, using diesel engine-generator units and accessories. Cost close to \$82,000. Financing is being arranged through Federal aid. C. Robert Fulton, 2527 South Nineteenth Street, Lincoln, Neb., is consulting engineer.

Grant County Board, Lancaster, Wis., has plans by J. G. Durant, architect, Boscobel, Wis., for \$80,000 machine storage, maintenance shop and warehouse for county highway department. PWA grant has been allotted. Eugene Croft is county highway commissioner.

City Council, Cumberland, Wis., has been allotted PWA grant of \$42,075 toward construction and equipment of new diesel generating plant. Mrs. K. D. Kavanagh is city clerk.

City Council, Green Bay, Wis., has approved preliminary plans for city garage, 140 x 240 ft., estimated to cost \$90,000, contemplated as PWA project. H. A. Draeger is city clerk.

City Council, Port Washington, Wis., is planning to proceed as municipal project originally intended as PWA project in 1936, construction of combination incinerator and general municipal utility garage and service building designed by A. C. Runzler, architect, 728 North Jefferson Street, Milwaukee, who is now preparing cost estimates. Addie Lynch is city clerk.

City Council, Black River Falls, Wis., has applied for PWA grant for construction and equipment of proposed \$120,000 diesel generat-

ing plant. Engineers are Mead, Ward & Hunt, Madison, Wis. E. H. Hagen is city clerk.

Board of Vocational Education, La Crosse, Wis., closed bids Oct. 19 for construction of addition, 141 x 200 ft., 2 and 3-story and basement, to manual training and domestic science institute estimated to cost \$340,000. PWA grant has been allotted. John B. Coleman is director of school.

◀ WESTERN PA. DIST. ▶

State Engineering Department, Capitol Building, Harrisburg, Pa., A. F. Jones, acting chief engineer, has let general contract to Skilken Brothers, 44 East Broad Street, Columbus, Ohio, for one-story service, repair and garage building in conjunction with new operating and office building at Waynesburg, Pa., for state highway department. Cost about \$150,000.

State Department of Purchases, Capitol Building, Charleston, W. Va., Fred M. Hawkins, director, asks bids until Oct. 24 for equipment for school at Romney, W. Va. L. D. Schmidt, Professional Building, Fairmont, W. Va., is architect.

Board of Education, Oil City, Pa., plans manual training equipment in new four-story senior high school, for which general contract has just been let to Ortman & Reitze, Meadville, Pa. Cost close to \$250,000.

◀ PACIFIC COAST ▶

Clorox Chemical Co., 850 42nd Avenue, Oakland, Cal., has let general contract to Campbell, Lowrie, Lautermilch Corp., 400 West Madison Street, Chicago, for new two and three-story branch plant, 103 x 360 ft., at Fifty-first Street and Merrimac Avenue, Chicago. Cost about \$300,000 with equipment. Carroll F. Morrison, 221 North LaSalle Street, Chicago, is engineer.

Los Angeles Water and Power Commission, 205 South Broadway, Los Angeles, D. P. Nicklin, purchasing agent, asks bids until Nov. 15 for quantity of galvanized steel towers for new transmission, making third circuit, from city limits to Boulder Dam hydroelectric power plant of Federal Government, Boulder Canyon, Arizona-California-Nevada (Specifications 2712).

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Oct. 26 for diesel-electric portal crane, connecting revolving hinged jib, A-frame, and machinery house, mounted on traveling gantry at naval operating base, San Diego, Cal. (Specifications 8937); also bids (no closing date stated) for equipment for power house at Puget Sound Navy Yard, Bremerton, Wash., including one 125,000-lb. per hour capacity pressure boiler, oil-burning equipment, superheater, air preheater, water heaters, pumps, mechanical fans, air and flue gas ducts, soot blowers, combustion control system and auxiliary equipment (Specifications 8821).

Board of Education, Fresno, Cal., plans addition to Edison technical high school, for which appropriation of \$200,000 has been authorized. Also will build one-story vocational shop additions to Fresno high school, and Longfellow and Washington junior high schools, each to cost about \$60,000. Charles H. Franklin, T. W. Patterson Building, and Frederick L. Swartz, Brix Building, both Fresno, are architects.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 1 for one motor-driven bench lathe (Schedule 4628), one motor-driven milling machine (Schedule 4629) for San Diego, Cal., naval air station; one motor-driven straight bevel gear generator (Schedule 4632) for Puget Sound, Wash., navy yard.

◀ FOREIGN ▶

Otago Harbour Board, Otago, New Zealand, asks bids until Nov. 30 for one or two traveling wharf cranes (Contract 823).

DeHavilland Aircraft of Canada, Ltd., Sheppard Avenue, Toronto, Ont., manufacturer of airplanes and parts, plans one-story addition, about 20,000 sq. ft. of floor space, to be equipped for expansion in plane fuselage division. Cost about \$80,000 with equipment.

THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

*... Foreign demand gives impetus at Cincinnati ...
Domestic business improving moderately.*

Buying Still Spotty In the Metropolitan Area

NEW YORK—Earlier predictions of more diversified buying on the part of general industry have not materialized so far, and it is still true as has been repeated so often that the principal buyers are aircraft engine and parts firms and those making instruments for aircraft and the Navy. The Navy itself is making very little progress on its 1938-39 appropriations for machinery, and for the present the arsenals are not actively buying machine tools. The large nationally known firms are still hesitant, and where inquiries have been issued they have been for machinery needed to complete Government contracts. Hence, the market remains very spotty. An exception to the general rule are small sheet metal working shops, which have been buying presses, brakes and shears, many of them gambling on the future upward trend.

Substantial orders have been received from British sources in the past month, and the Russians continue to buy American equipment.

Foreign Business Runs Ahead Of Domestic at Cincinnati

CINCINNATI—Machinery demand moved upward a bit the past week under impetus of slightly better foreign demand. In fact, the export business outgained domestic interest to place the market in the relative position of two months ago. Light tools are predominant with lathes, grinders and millers most active. Some difficulty is still being experienced to get releases on orders from Czechoslovakia, but other business is going forward at good rate.

Domestic Business Picks Up Slowly at Cleveland

CLEVELAND—The volume of domestic business continues to pick up slowly in this district. One of the noteworthy sales during the past week was a large miller-planer to a machine tool manufacturer in this vicinity. At the recent auction sale at the Stutz plant in Indianapolis a few machines were picked up for resale in this district. It was indicated by those attending the auction that prices on used equipment are holding up well. Machine tool manufacturers' backlogs remain large, extending in many cases into next year, due to foreign bookings.

Scrap Salvaging to Call For Equipment at Detroit

DETROIT—Installation of special rolling equipment in a number of body plants to process sheet steel scrap will lead shortly to the purchase of new conveyor equipment. Shears or cutters are to be incorporated with the dies to trim the scrap into suitable lengths for processing. It is understood that most of the large stamping plants in the Detroit area are considering such installations, already have them in operation, or have equipment on order. With the return of the automobile industry to substantial production heights, the small tool industry has shown signs of steadily increasing activity.

Rock Island Arsenal in Market for Tools at Chicago

CHICAGO—Of outstanding importance this week is a proposal from the Rock Island Arsenal for a number of large tools, the program being estimated roughly at around \$250,000. Already this Federal agency has placed small tool orders which in at least one selling office have exceeded all previous single entries. A noticeable improvement in individual machine tool business is being seen and sentiment throughout the trade is considerably better. Recent price fluctuations in steel are expected to have no influence on the machinery market.

Machine Tool Index Lower in September

CLEVELAND.—Machine tool orders in September declined slightly from August, according to index figures of the National Machine Tool Builders' Association. The September index was 117.4, compared to 120.9 for August and as against 210.7 for September a year ago. Average for the last three months was 109.3.

Machine Tool Builders Envisage Vast War Market But Fear Result

A TREMENDOUS volume of business would probably come to American machine tool builders were Europe to become involved in a war, but the industry does not want that kind of business, knowing full well what the ultimate consequences would be.

This viewpoint was expressed by Howard W. Dunbar, vice-president, Norton Co., and president of the National Machine Tool Builders Association, in his opening address at the 37th annual convention of the association at Hot Springs, Va., on Oct. 17.

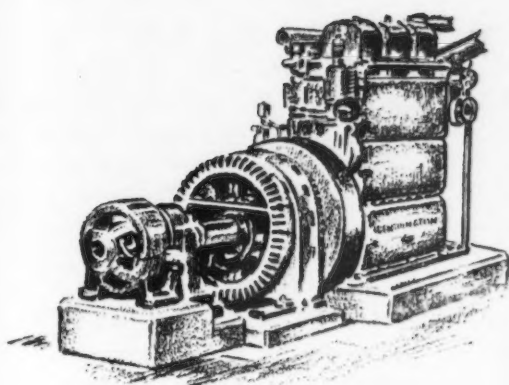
With a world war again imminent, the industry regards a strong navy and a well equipped army as insurance against the possibility of invasion. In this connection, Mr. Dunbar mentioned that discussions with ranking executives of our armed services has developed the great need for replacement of obsolete equipment in government establishments, particularly machine tools which are not standard and which cannot be built on the spur of the moment. The time to modernize our arsenals is now.

Cooperate With Government

The committee on cooperations with government departments has provided for the procurement planning divisions of the Munitions Board a complete catalog of the standard machine tools available in this country, as well as a summary of the productive capacity of the industry.

The committee has also discussed with officers in charge of buying for current needs how they can improve their buying procedure so as to get the quality they want without violating the laws under which they work and how they can make their procedure simpler for the machine tool builder.

Continuing his presidential address, Mr. Dunbar discussed domestic problems and saw much encouragement for the future, particularly as to the replacement of obsolete machinery, the need for cutting costs and the need for machinery for making new products. Another speaker who discussed industry's social responsibilities was Louis Ruthenberg, president of Servel, Inc.



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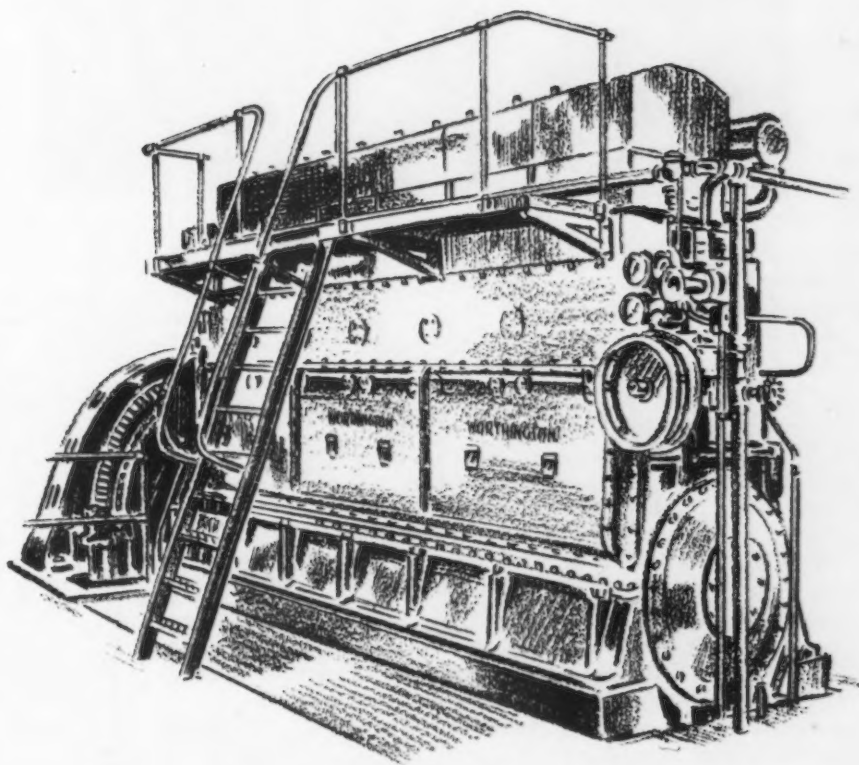
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WORTHINGTON

Large Steel Wind Tunnel Completed at M. I. T.

(CONCLUDED FROM PAGE 28)

plates were formed at the Neville Island, Pa., plant of the Pittsburgh-Des Moines Steel Co., which secured the contract for the structural design, fabrication and erection of the tunnel in

Test data are recorded from the test section by means of electrically-operated recording instruments. The test section inside the tunnel is of wooden construction and is in the shape of an



October, 1937. Jackson & Moreland, Boston, were the supervising engineers.

The completed tunnel is a cylindrical and conical tube arranged so as to form a rectangle measuring about 44 x 89 ft., and making a closed air circuit 196 ft. 2 in. in length along the center line. Inside diameter varies up to a 12 ft. 11 $\frac{3}{4}$ in. diameter propeller driven by a 2000-hp. a.-c. motor having four speeds from 450 to 1200 r.p.m. The air stream is turned around the corners by crescent-shaped vanes designed so that the direction is changed efficiently and in such a manner that a uniform cross section of air velocity is maintained. Vanes in the two corners are hollow and are fitted with an interior cold water spray as a means of cooling the air stream. In order further to regulate the air stream temperature, the entire outside of the tunnel is sprayed with water during operation and the temperature is controlled to a maximum of 150 deg. F.

ellipse 7 ft. 6 in. high, 10 ft. wide and 15 ft. long.

A removable panel in the steel shell and a smaller door which operates on large floating hinges, provide access to the interior of the tunnel. Both these openings are located inside the new laboratory control building which has been erected adjacent to the tunnel.

To provide for expansion and contraction due to changes in temperature and pressure and to reduce operating stresses, the tunnel is suspended by a system of flexible hangers except at the motor section where it is fixed to a concrete foundation.

Being subjected to high pressures and near vacuum, the tunnel had to be leakproof. It was proved to be so, by a hydrostatic test made by filling the structure with 320,000 gal. of water, and creating a gage pressure of 54 lb. per sq. in. or 25 per cent in excess of the intended working pressure.

The Wright Brothers wind tunnel will be put to use immediately testing various aircraft models under different pressure and velocity conditions, and will also be used during the college year for the instruction of undergraduate engineers.

Wright Brothers wind tunnel during construction at the Massachusetts Institute of Technology. Assembly of the structure, which required more than 200 tons of steel plates, was by welding.

